

Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

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ROTARY KILNS

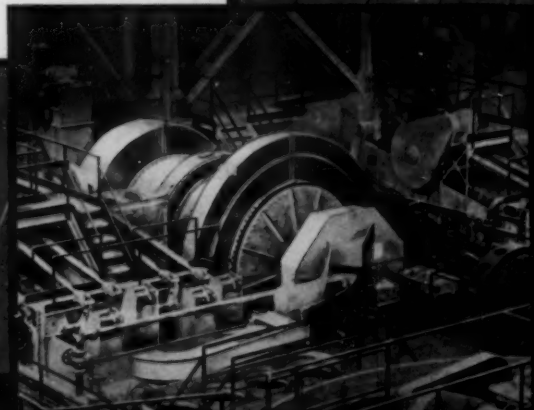
ROTARY KILNS

For sintering, nodulizing, calcining, desulphurizing and oxidizing and reducing roasting—also coolers, pre-coolers, preheaters, recuperators—and their accessories.

GRINDING MILLS

Ballmills, tubemills and multi-compartment mills—wet or dry grinding—open or closed circuit—also air swept for grinding and drying.

GRINDING MILLS



F. L. SMIDTH & CO.

60 EAST 42ND STREET

ENGINEERS AND
MACHINERY MANUFACTURERS

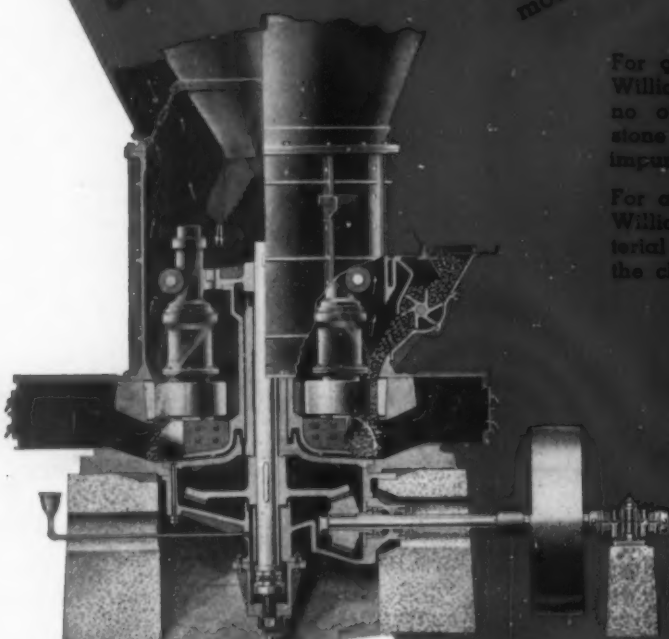
NEW YORK, N. Y.

MAY 21 1943

Williams

Fine Grinding Equipment for all Branches of the **LIME INDUSTRY**

Contemplating Improvements? — then investigate the Williams complete line of Lime Plant crushing, pulverizing and air separating equipment — successfully operating in a large number of today's modern lime plants.



Sectional view above of the Williams Improved Roller Mill, photo below shows operator producing agricultural limestone with Williams Mill.



HYDRATED LIME

For grinding hydrated lime to 400 mesh — the Williams Impact Mill. Permits perfect sizing with no oversize — eliminates cores and unburned stone with minimum of hydrate rejected with the impurities.

For a super-high grade chemical hydrate — the Williams Mechanical Air Separator. Takes material directly from the hydrator and separates the clean hydrate from the impurities.

BURNED LIME

For finenesses ranging from 98% — 200 mesh to 99% — 325 mesh — the Williams Roller Mill with Spinner Air Separator. No clogging of separator — impurities spouted out or reground to same fineness as the lime.

AGRICULTURAL LIMESTONE

The Williams "Slugger" Crusher will handle quarry run rock and reduce to agricultural limestone in one operation — seven sizes — 30 to 150 horsepower.

Williams Patent Crusher & Pulverizer Company

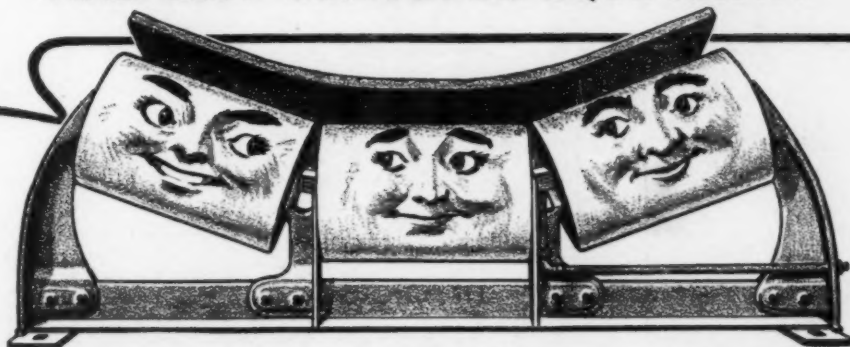
600 St. Louis Ave.

St. Louis, Mo.



WILLIAMS
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
WILLIAMS
PATENT CRUSHERS GRINDERS SHREDDERS

BE WISE—PROLONG THE LIFE OF CONVEYOR BELTS AND BELT CONVEYOR EQUIPMENT!



If "we" could only talk—here's what we'd say: "Operators, please give us extra special care to make us last longer. This is mighty important during wartime, because materials used in belt conveyor equipment are needed for guns, tanks, planes and other war equipment. Be wise—be patriotic—follow this advice—it will pay extra dividends in trouble-free operation."

1
✓



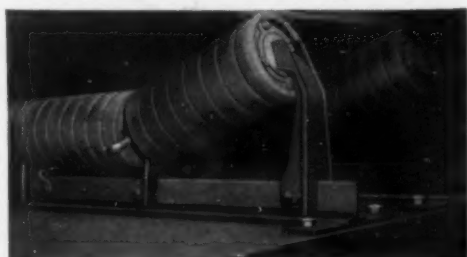
KEEP INSTALLATION CLEAN. Cleanliness plays an important part in prolonging the life of your belt conveyor equipment. Make a daily inspection to see that there is no accumulation of material that has spilled off the belt. If material is not removed it will cause the belt to drag over it as well as around the head, tail, snub and other pulleys. Consideration should also be given to cleaning the belt. The material being handled determines the type of cleaning device.

2
✓



TRAIN THE BELT AND MAINTAIN THE TRAINING WITH SELF-ALIGNING IDLERS. It is important that both the carrying and return runs of a conveyor belt be kept practically central with its supporting idlers. This can be accomplished by properly "training" the belt on the conveyor . . . maintaining that training is assured through the use of self-aligning idlers and return rolls. Link-Belt manufactures a complete line of self-aligning idlers to meet every need.

3
✓



USE IMPACT IDLERS AT LOADING AND TRANSFER POINTS. When tons of ore, rock, coal and other materials slap a belt on the back, proper protection must be given at the loading point. The use of Link-Belt Rubber-Tread Impact Idlers definitely prolongs belt life by preventing cutting and bruising of belt . . . cushioning even the heaviest blows . . . thus greatly increasing belt life and protecting the belt, idler bearings and framework. Link-Belt engineers will be glad to make recommendations.

4
✓



MAINTAIN PROPER BELT TENSION AND LUBRICATION. Eliminate excessive belt sag between idler rolls—Proper tension relieves the belt of much unnecessary wear . . . Never over-lubricate idler rolls—inspection of one idler roll will often determine at what intervals equipment should be lubricated. Too much grease is as bad as too little.

AND MAKE IT A RULE to establish regular inspection periods—and make replacements with genuine Link-Belt parts when necessary. Link-Belt manufactures a complete line of idlers, pulleys, bearings, take-ups, drives, trippers, etc.

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY
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houses and distributors in principal
cities. 0087



For PROPORTIONING Use the "FEEDOMETER"

Two or more Constant Weight Feeders or "Feedometers" will accurately proportion materials that are to be processed. Records of weights delivered at any time are available.

The method is simple—time saving and accurate.

Especially adapted to handle large quantities.

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TORONTO, 200 Bay Street

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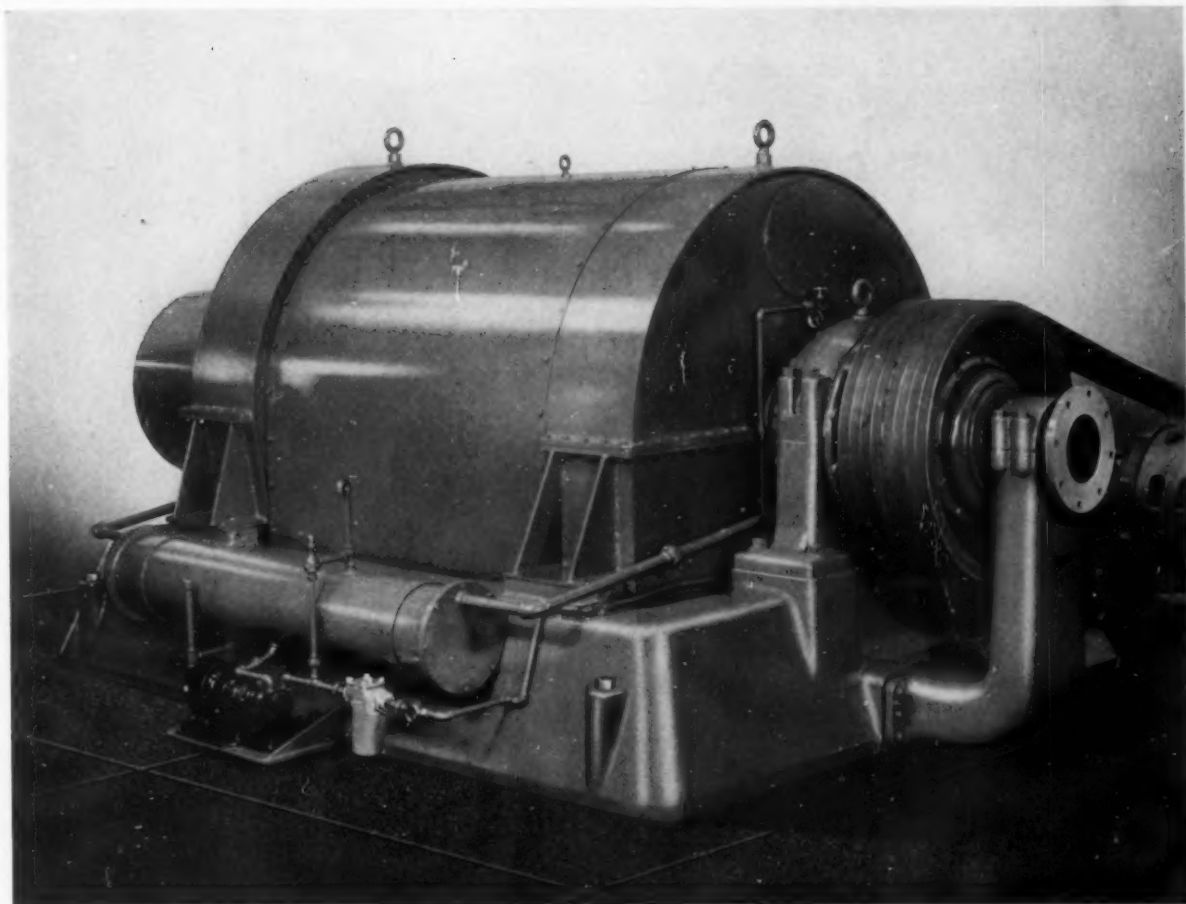
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Put the slurry from the wet grinding circuit through this BIRD CLASSIFIER and you get:

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- continuous delivery of a ton of cement a minute from a single, self-contained unit taking up only 135 sq. ft. of space and weighing only 15 tons.

Wouldn't it be a good idea to get the whole story on the Bird Continuous Centrifugal Classifier?

BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS



FOR CORROSIVE LOCATIONS.
These oil-immersed combinations are made in two forms — for both corrosive and hazardous locations.

NEW HIGH-VOLTAGE COMBINATION. This provides split-cycle short-circuit protection and starting means for high-voltage motors.

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CONTROL THAT WAY!
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Save man-hours and critical material by specifying General Electric combination starters. General Electric Company, Schenectady, N. Y.

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Enclosed in a high-strength, alloy case, these starters are ideal for Class I, Group D, locations.

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For outdoor application and for installation in damp locations.

FOR GENERAL-PURPOSE USE
These combinations are for indoor applications where atmospheric conditions are normal.



COMBINATION STARTERS FOR MOTORS FROM 1 TO 1000 HP



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IN THE SCRAP**

**BOOM OPERATION PLUS HOISTING
WHILE SWINGING *Saves Time...***

It's no joking matter this idea of getting the scrap in the scrap. It's a must for '43. Even the boys on the battlefield have special salvage units which lug the scrap metal away from the combat areas. And the war isn't held up while they do it . . . bombs fly . . . bullets whiz by . . . shells burst in air . . . as they hurry the scrap back to the mills to make a new fighting unit. Our soldiers know how vital this scrap is in attaining VICTORY. So let's all get our scrap into the scrap today. Casualties will be cut in two . . . scrap piles will swell . . . and Koehring Cranes will help speed up a victory with its boom operation plus hoisting while swinging.

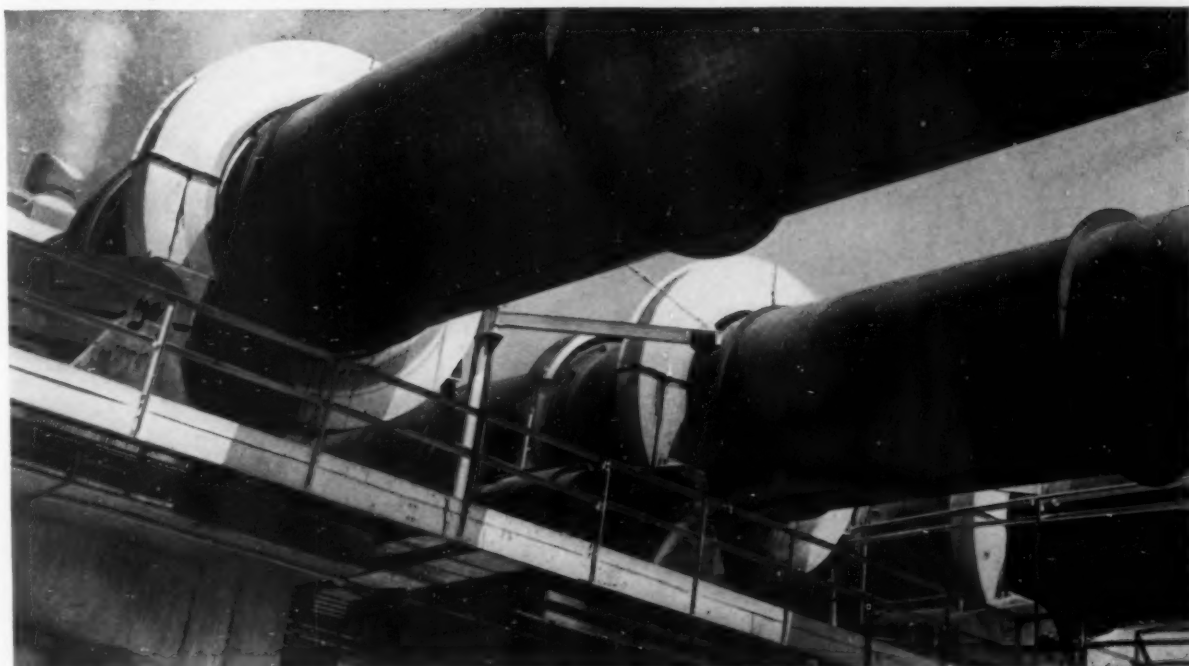
KOEHRING COMPANY • Milwaukee, Wisconsin



HEAVY-DUTY CONSTRUCTION EQUIPMENT

TRAYLOR

KILNS ★ COOLERS ★ DRYERS



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
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Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

“**W**AY BACK WHEN” Traylor built its first Rotary Kiln, the size of that first unit (it was 9'-0" dia. x 175'-0") was considered quite unusual, and it probably was among the largest of that day. Nowadays, that is thought to be a very ordinary size, since diameters run up to 12'-0" and lengths to 450'-0". Also, Traylor activity in building Rotary Kilns, instead of being confined to the cement industry, as in that former day, now embraces lime manufacture, chemical and process industries and metallurgy. In fact, many of “the greatest” in all of these industries have standardized upon Traylor Rotary Kilns—and Traylor Rotary Coolers and Dryers, as well.

The march of progress brings many changes in all things, but one characteristic of Traylor Rotary Kilns, Coolers and Dryers **HAS NOT CHANGED**, from the

very beginning—they were always, as they are today—the finest of construction procurable, and the most efficient in performance. This is true because, in addition to the metal of which each unit is composed, there are built into it many ideas, represented by many devices to increase efficiency and decrease costs—ideas based upon an intimate knowledge, on the part of our engineers, with the work that it must do, knowledge gained by constant observation and study.

At this time, Traylor Rotary Kilns, Coolers and Dryers are not procurable except for the most urgent necessity in the furtherance of the war program, but wise operators, who are thus “blackened out” temporarily, will choose such a time to prepare for a future that is certain to be most competitive. Our technical facilities are available for just that purpose. We invite correspondence.

SEE OUR BULLETIN No. 115

TRAYLOR

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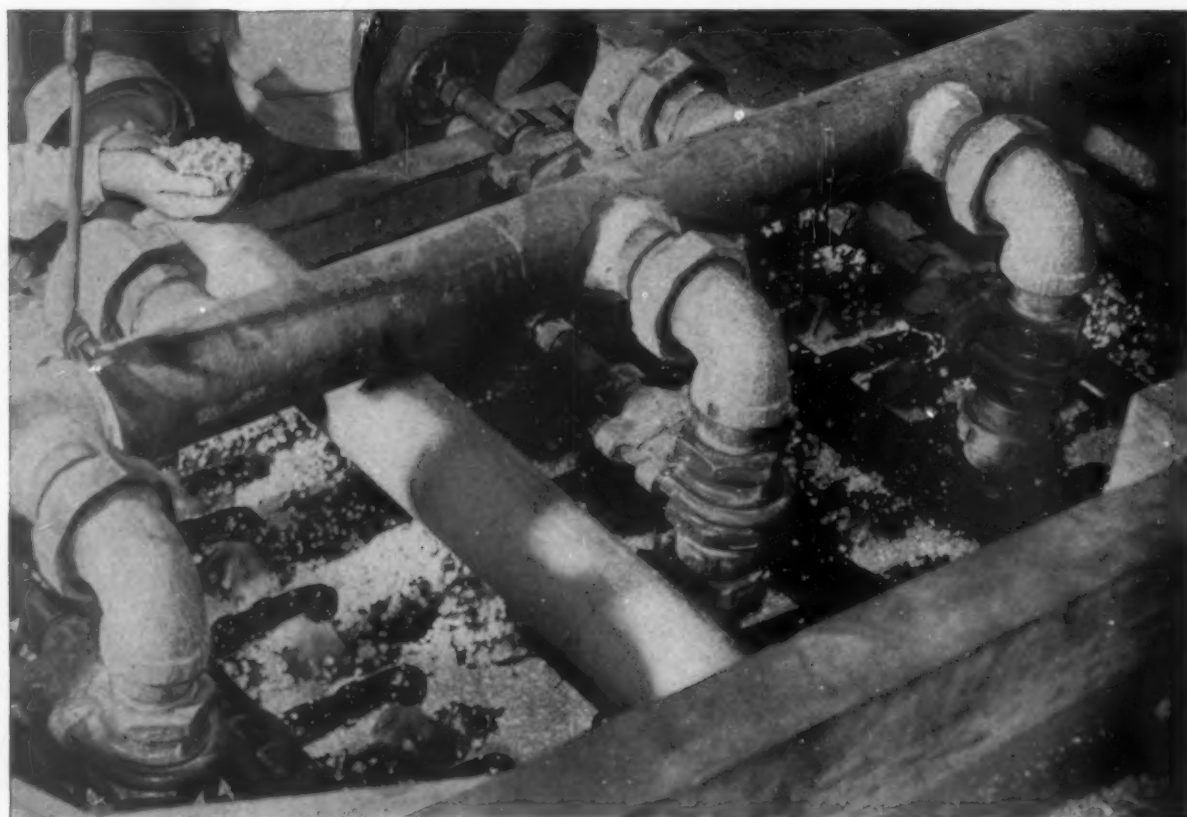
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Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, Montevideo

MAY, 1943



OUT OF THESE FLOCS MAY COME THE FUTURE OF THE WORLD

These white crumbs or "flocs" look very unimportant in themselves . . . but on them may depend the future of the world. They are one of the first stages in the production of synthetic rubber, the most vital material being produced in America today.

Naturally, you are interested in synthetic rubber. But synthetic rubber is only incidental. What is really important is what happens to synthetic rubber after it is actually produced. It is chemistry that makes rubber fit to use, suits it to the task at hand.

United States Rubber Company is the largest manufacturer of rubber chemicals in the world. We have worked with rubber, improved it and broadened its uses for 100 years. Today, all this tremendous fund of knowledge of the chemistry of rubber is being drawn upon to improve synthetic rubber, perfect it for the jobs it must do for the Armed Forces and war industry.

The chemistry of rubber is what determines the final compounding and processing of the flocs of synthetic rubber you see here. They may eventually go into bullet-sealing hose, air ducts, or any one of a score of other parts used

in the plane that will blast the last Nip carrier off the sea. They may be made into a tire that will rumble down bomb-battered Unter den Linden. They may go into some essential equipment like a conveyor belt that will keep America's war production line moving at top speed. They might very easily determine the entire course of the war, and thereby the future of the world.

Synthetic rubber, its production, compounding and application to war and industrial uses, is too big a story to present adequately here. There are five basic commercial types of synthetic rubber. Each of them has distinct properties and characteristics. Not a single one is ideal for all purposes.

Deciding which synthetic rubber to select and use for a particular task is an equally big story, a decision that requires expert knowledge and broad range experience.

We have told the story of the five basic commercial types of synthetic rubber, our more than twenty years of experience in working with them, and our twelve years of using synthetic rubber commercially in an interesting, informative booklet for business executives. Please ask for your copy on your regular business letterhead.



UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE, ROCKEFELLER CENTER, NEW YORK

In Canada: Dominion Rubber Co., Ltd



Jeffrey combination pan conveyor and picking table. Handles burned lime from kiln to lime screening and crushing plant.



Jeffrey inclined bucket elevator handling kiln stone from crushing plant to storage bins. A Jeffrey steel apron conveyor handles flux stone from screens to railroad cars.



Jeffrey belt conveyors provide an uninterrupted flow of sand, crushed stone, lime, cement, etc., both in the quarry and the processing plant.

SPEED PRODUCTION IMPROVE HANDLING METHODS

A faster way of doing the job . . . a quicker way to move materials and products. Today . . . as yesterday, the Jeffrey aim is to help you do that job better and to keep your plant modern and efficient. For high productivity . . . specify Jeffrey.

Chains	Feeders	Screens
Car Pullers	Grinders	Transmission
Conveyors	Idlers (belt)	Machinery
Crushers	Pulverizers	Waytrols—accurate
Elevators	Portables	gravimetric feeding

THE *Jeffrey* MANUFACTURING COMPANY
935-99 North Fourth Street, Columbus, Ohio



Jeffrey heavy duty bucket elevator and belt conveyor installation in a large quarry operation where high productivity is important.

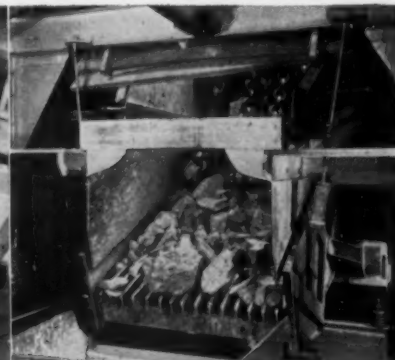


Jeffrey portable bucket loaders are ideal and inexpensive for pit to truck loading or reclaiming from storage piles. Also portable belt and scraper conveyors.

Jeffrey Waytrol (below)—a precision unit for accurate gravimetric feeding, batching and proportioning—may be remotely controlled.

Jeffrey pulverizer installation (below)—unit being fed by a Jeffrey steel apron conveyor. Also crushers and grinders.

Jeffrey-Traylor electric vibrating 8' wide grizzly feeder (below). Controls feed and by-passes fines ahead of primary crusher.



Over that Horizon comes *Freedom*



PAUSE, Norseman, and look to the western horizon. For twenty centuries the Vikings roved beyond it. Today, hundreds of your brothers have escaped across this horizon, and will return with their allies to win back your Nazi-cursed soil.

You toil by day beneath the lash of your oppressors. But, by night, you strike back again and again—for your love of freedom is unconquerable.

As you do your part, so do we. The mine and quarry men of America are applying their effort and skill toward freedom for the world. The millions of tons of rock and coal and ore that they blast loose are the very genesis of war machines and munitions. To speed their work and safeguard their lives, the Ensign-Bickford Company is producing Safety Fuse, Primacord-Bickford Detonating Fuse, and other supplies essential to Victory—for *Victory Begins Underground!*

THE ENSIGN-BICKFORD CO.
SIMSBURY, CONNECTICUT

E-P



Primacord-Bickford
Detonating Fuse

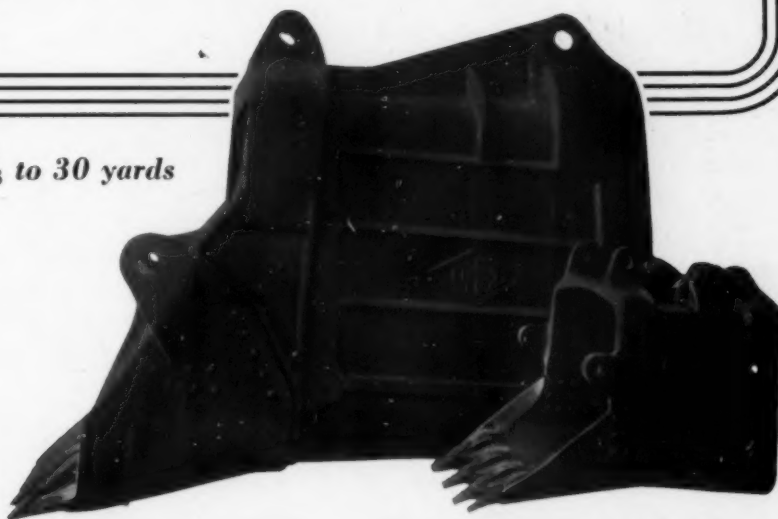
Our Country expects increased output in iron mines, coal strip mines and construction work to help win the war



WELDED DIPPERS

Increase the output of shovels as much as 30% without increased power or wear on parts. Elimination of unnecessary weight in the dipper, by welded construction, makes this added shovel capacity. At no time in the history of our nation has the efficient operation of power shovels been so vitally important as it is today. Consult your shovel engineer about PMCO Welded Dippers for increased production.

Sizes from $\frac{3}{8}$ to 30 yards



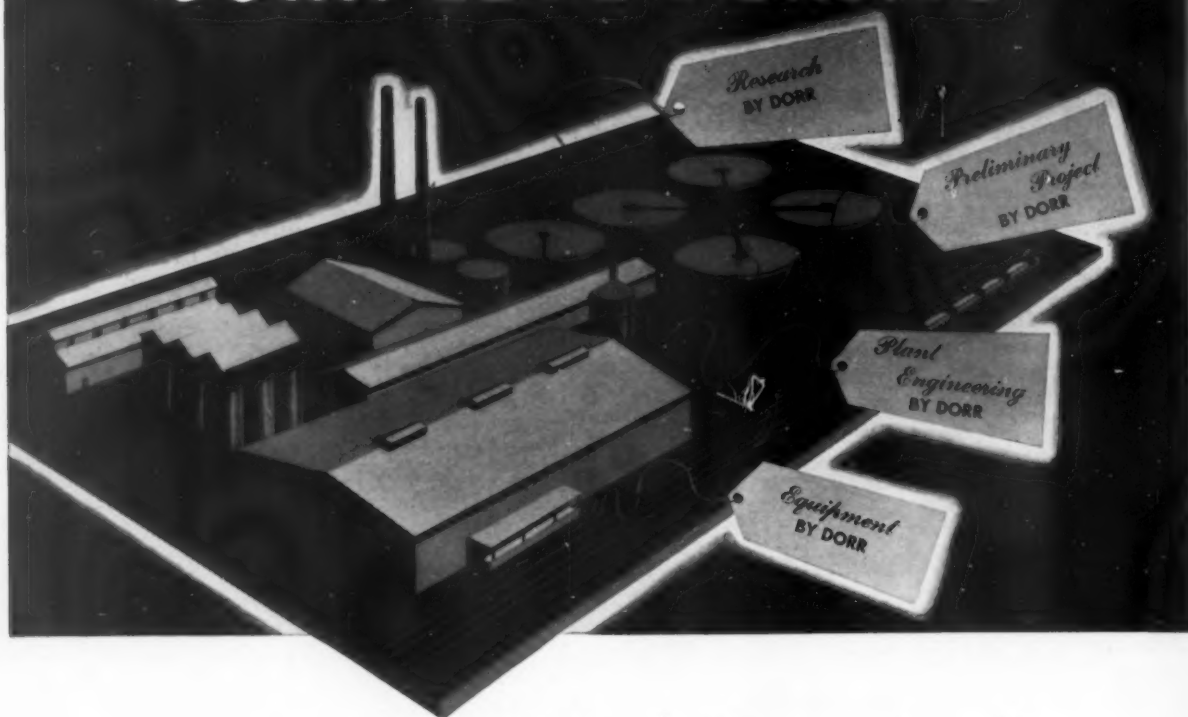
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For thirty-two years "know how" has been the basis for results produced by Dorr equipment—a "know how" founded firmly on the knowledge obtained from ever broadening applications, backed by a modern research laboratory.

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Tests to determine method of treatment from the standpoint of efficiency, economy and grade of product required.

Preliminary Project

Preparation of diagrammatic and quantitative flowsheets. Estimates of

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The complete design and specifications of the plant necessary for erection.

Equipment

The purchase of all equipment and the supervision of erection and initial operation.



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ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

Rubber

WILL RIDE TO VICTORY ON THE SEVEN C'S

THE "Seven C's" are *Conservation*, to salvage all rubber for re-use; *Care*, to make what we have last longer, do more; *Cooperation*, in use and allocations; *Compounding*, to produce the best mechanical rubber goods within the limits of supply; *Construction*, of fabric and reinforcement so that less rubber may do more; *Collaboration*, of the entire Rubber Industry for the good of all; *Courage*, to pursue research and development relentlessly.

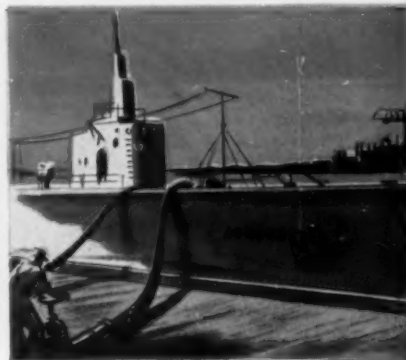
The entire mechanical rubber industry is applying its collective ingenuity, experience and skill from laboratory to shipping platform with results which, at times, may look like miracles to anyone unfamiliar with the sustained research which is an inherent part of the story of Rubber.



In a single airplane there are hundreds of rubber parts, including hose for fuel, oil lines and hydraulic controls; packings, and vibration dampeners.



Tanks need rubber at many points—rubber that will withstand heat, cold, oil, abrasion.



Submarines require acid-resisting rubber for battery compartments; other kinds of rubber in gaskets, mountings, and for scores of special applications.



Thousands of pounds of rubber go into every warship at hundreds of places from propeller shaft to gun decks and fire control tower.



Trucks and gun carriages require rubber for hydraulic brake parts, for shock absorption, and for other vital uses.

50th YEAR OF RESEARCH

THE half century mark now reached at MANHATTAN finds the thousands who work within its several plants too busy to take full note of this milestone in a long record of achievements. Among these are: Compensated Power Transmission Belting in which all plies have equal stresses; the Extensible Tip for prolonging the life of endless belts; the Homoflex hose construction principle which increases the flexibility and multiplies the life of rubber hose—often many times; Radio-Active treated fire hose that resists mildew; first to adapt synthetic rubber in oil-proof rubber products; Vibration Dampener Bushings for portable grinding wheels.

These are but a few of the MANHATTAN developments which are contributing to conservation of rubber by prolonging service life, and to greater production.

**THROW YOUR SCRAP
INTO THE SCRAP!**



THE MANHATTAN RUBBER MANUFACTURING DIVISION

of RAYBESTOS-MANHATTAN, INC.

EXECUTIVE OFFICES

PASSAIC, NEW JERSEY

KEEP AHEAD WITH



SPECIFY "CONTINENTAL"

If you need a complete Belt Conveyor installation or simply a replacement idler, Continental can take care of your requirements. Continental BC Idlers are giving an excellent account of themselves in all types of industries under varied conditions. They are made in a complete range of sizes and types for all kinds of service.

Continental can also furnish any of your belt conveyor accessories, including Pulleys, Take-ups, Bearings, Speed Reducers, Drives, etc. For complete Belt Conveyor Service—Specify "Continental"—Engineers and Manufacturers of Conveyors and Power Transmission Equipment.

INDUSTRIAL DIVISION
Continental GIN COMPANY
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The obligation of leadership

Through the years since Adelmarr M. Bates invented the Bates Valve Bag and the Bates Packer, St. Regis Paper Company has been favored with a constantly growing volume of business from producers of lime, cement, plaster and affiliated products.

This wide acceptance and use of St. Regis Packaging Systems is due in large measure to the *specialized service* rendered by our engineers and field service organization. In daily relations with customers, these men have first-hand knowledge of current conditions. This intimate acquaintance with packaging operations, combined with our vast experience in the manufacture of paper bags and bag filling and closing equipment, enables our representatives to offer authoritative advice and suggestions.

As leaders in the industry we consider it our obligation to maintain continuing research and development for the betterment of paper bags and packing and closing equipment, and to be prepared to offer the *specialized service* which has established and maintained the St. Regis reputation to any manufacturer interested in exploring the economy and efficiency of paper bag packaging.



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*Make Those Minus Half
Inch Sizes... WITH*
**SHORT HEAD
CONES..**

The Symons Short Head Cone Crusher was developed to provide increased output of extremely fine products — *minus half inch and finer*. Installations in stone, gravel and slag plants prove that this crusher not only produces finer sizes in greater tonnage but at a cost much lower than is possible with any other type of crushing equipment. Fine crushing problems are forgotten with the installation of a Symons Short Head Cone.

NORDBERG MFG. CO.
MILWAUKEE WISCONSIN

NEW YORK • LOS ANGELES • LONDON • TORONTO



SYMONS CONE CRUSHERS

HE MIXES LOW-SLUMP CONCRETE FASTER...



HIGH-DISCHARGE truck-mixing was a troublesome problem child for civil engineers and contractors not very long ago. Discharge was slow; the drum and blades wouldn't scour; the mixing actions balked at handling low-slump concrete.

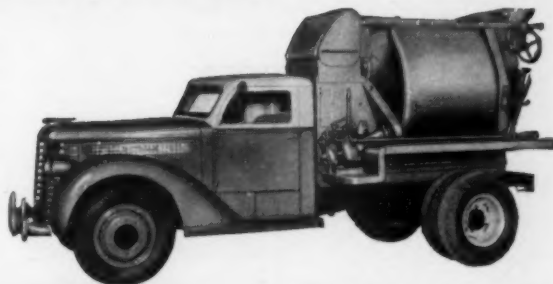
Rex Mechanical Engineering—Rex M. E.—found the answer for all in a blading design which makes the mixing action go uphill, *in the discharge direction.*

This is of extreme importance in the early stages of all concrete mixing, as otherwise the main mass tends to rotate with the drum, and the mixing is delayed.

The Rex mixing action makes discharge faster. The drum and blades are self-cleaning—scoured from end to end. There is no pocketing, no bulking, no building up of concrete.

Mixing dry or low-slump concrete is speeded up as much as 50 to 100%.

It is one of many inventions that Rex Mechanical Engineering—Rex M. E.—has provided in machines for mixing concrete, placing concrete and for removing water at maximal efficiency and minimal cost and waste.



CONSTRUCTION MACHINERY

Concrete Mixers • Moto-Mixers • Pavers • Mortar
and Plaster Mixers • Speed Prime Pumps • Pumpcretes

CHAIN BELT COMPANY OF MILWAUKEE

RAYMOND SUPER MILLS

*The Answer
to Big
Production*



A COMPLETE JOB . . . IN ONE OPERATION

Drying, grinding, separating
and conveying material to finish
bin . . . dustless, automatic,
efficient.



TODAY'S demands for huge output are easily met by Raymond SUPER ROLLER MILLS . . . capable of producing large tonnages in grinding such materials as coal, limestone, langbeinite, phosphate rock, clays, gypsum and various manufactured products to a fineness from 50-mesh to 99% passing 200-mesh.

Pulverizing 25 to 30 tons an hour of Florida phosphate rock to 50% minus 200-mesh . . . drying and pulverizing raw limestone at 13 tons per hour through 65-mesh, with less than 1% final moisture . . . these are typical examples of SUPER MILL performance.

Raymond SUPER MILLS may be equipped with whizzer separators, having variable speed control that provides wide range fineness regulation; or with the double-cone separators . . . or built in the Low Side type of mill with standard air separation. The air-drying system may also be used with these SUPER MILLS for removing surface moisture from the material while grinding.

Write for Roller Mill Catalog

RAYMOND PULVERIZER DIVISION

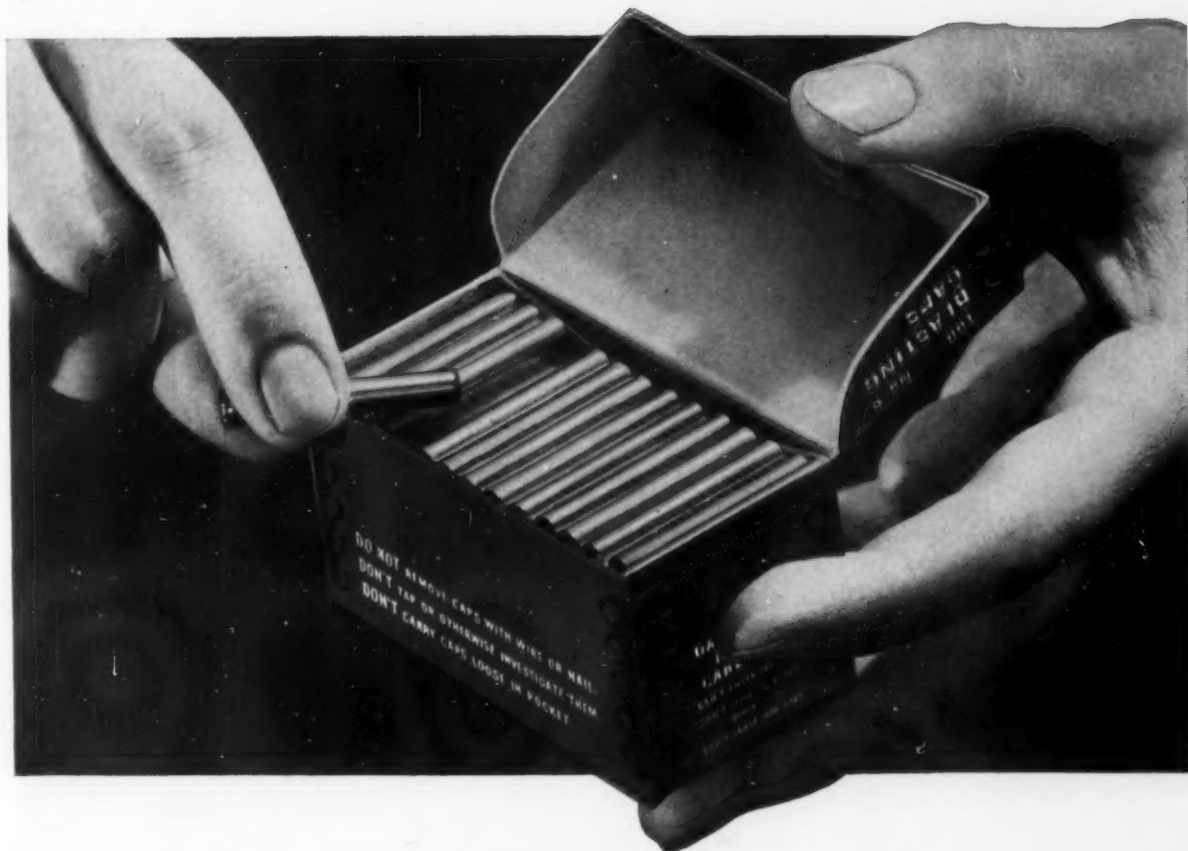
COMBUSTION ENGINEERING COMPANY, INC.

CHICAGO

1307 North Branch Street

Sales Offices in Principal Cities . . . In Canada: Combustion Engineering Corporation, Ltd., Montreal

NEW Safer...More Convenient Packing for DU PONT BLASTING CAPS



Du Pont Blasting Caps are now packed in multiple, horizontal rows—instead of vertically. The result is a package that's safer, easier, and quicker to use.

PROTECTS OPEN CAP ENDS

Opening this new box does not expose the mouths of the caps because they rest against a permanent side of the box at all times. Thus, drops of water, sparks, grit, and other foreign matter can't get into the open cap ends. This reduces the possibility of misfires due to wet caps—and lessens the chance of accidental detonation when caps are being fused.

MAKES CAPS EASIER TO REMOVE

With the new horizontal packing it's easy to grasp and remove the first cap and all subsequent caps. There's no need to tip the box and the caps left in the container remain in orderly horizontal rows.

Dependability and safety are the two factors you want most in a detonator—and you get them both when you use Du Pont Blasting Caps. These caps are so reliable that users have purchased over 3½ billion since we began to manufacture them in 1897. This new horizontally-packed cap box is still another guarantee of their safe, dependable

performance. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Del.



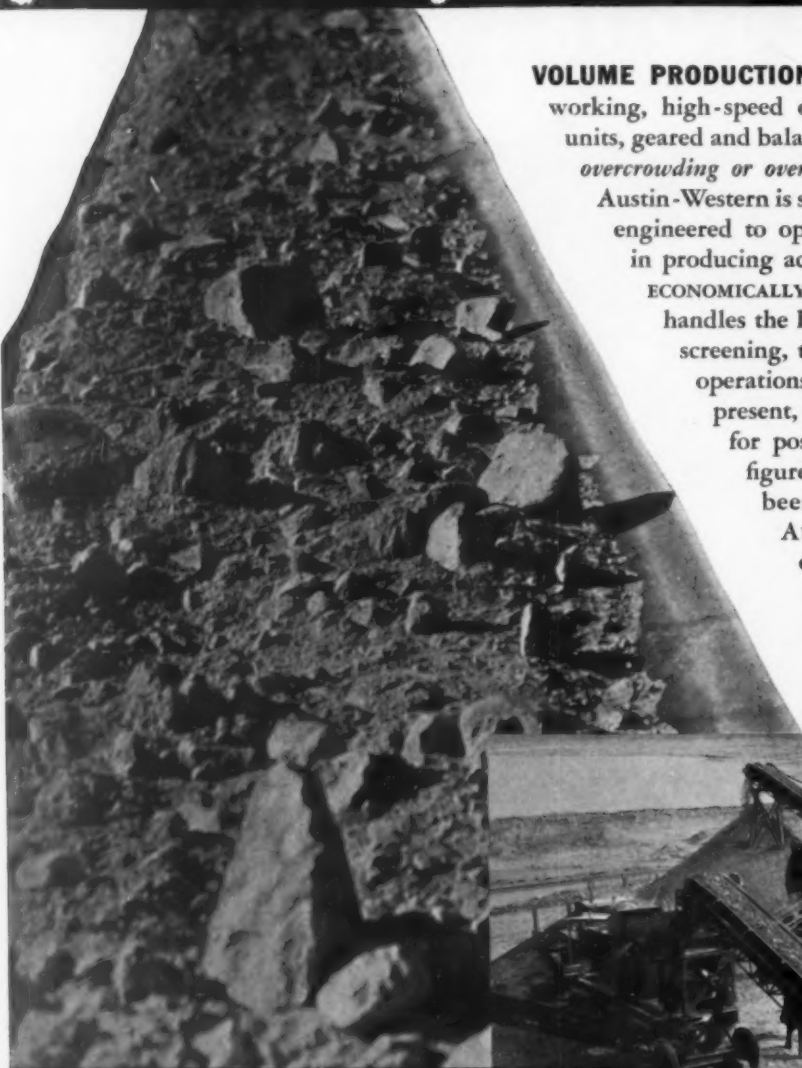
SAVE FATS FOR EXPLOSIVES

Fats are urgently needed for making glycerin—essential for the production of high explosives. Urge housewives to aid the war effort by taking waste fats to their butcher.



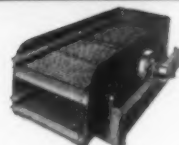
Yardage that yields **PROFIT!**

VOLUME PRODUCTION PAYS, but it takes a steady working, high-speed outfit. One with big capacity units, geared and balanced to operate *without fear of overcrowding or overloading*. The new Twin Unit Austin-Western is such a job. It's a two-plant team engineered to operate together (or separately) in producing accurately sized aggregate **VERY ECONOMICALLY, IN EXTRA LARGE VOLUME**. One handles the heavy or primary crushing and screening, the other the fine or secondary operations. Though built for war use at present, it is well to keep them in mind for post-war work. Verified tonnage figures, of plants now in use, have been extremely favorable. **THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois, U. S. A. Distributors in Principal Cities. Cable Address: AWCO, Aurora.**



BUILDERS OF ROAD MACHINERY
Austin Western
SINCE 1859

Twin-Unit teamwork on this important war job kept the stone requirements well ahead of schedule.



Individual units to meet a wide variation of requirements are also built by Austin-Western.

Logistics

IS SHIPS AND MEN AND WIRE ROPE...



ROEBLING "Blue Center" helps 'em get there first!



Pushing stubby assault boats ashore, through withering enemy fire, storming the beaches and mopping up enemy strong points—advancing inland to take and hold strategic airports, towns, road and railroad junctions—there is more to a successful invasion than these stirring deeds of U. S. fighting men in North Africa. To make that invasion possible, to make it stick till all objectives are fully attained, takes the brains and brawn of thousands of men who may never get to see the fighting at all—sailors on escorting warships, seamen on transports, dockworkers and stevedores to load and unload thousands of tons of equipment and supplies. It is these men and their ships and their rope-equipped machinery that

make up the physical basis of *logistics*—the art and science of getting there first with the most and *staying longest!*

It's a tough job, meeting all the needs of a sizeable army in the field against a powerful enemy. Army Engineers and special stevedore units, Navy crewmen, merchant seamen—all of them swing to with a will. And they keep the ammunition coming for men and guns. In many of these places where the going is tough today, Roebling "Blue Center" Steel Wire Rope is in there swinging. Bringing to this tough job too the extra values built into it by Roebling Engineers out of their experience in the field—in Roebling's mills—in Roebling Development Engineering. Meeting unflinchingly all the demands of Victory.

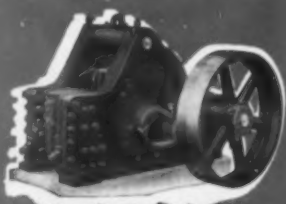


YOUR ROPE LOGISTICS... GET THE MOST OUT OF IT!

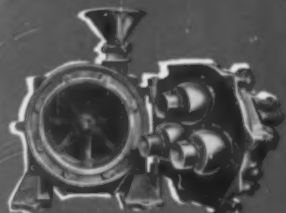
You can do a lot to save steel by observing simple precautions in the installation and handling of wire rope, and help conserve rope for use by our fighting men. To make the job even easier, Roebling has prepared a handy tag—yours for the asking—to fasten right to your machinery

where it'll do the most good. Our nearest office will gladly supply you with as many as you need. Ask for Tag "A".

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities



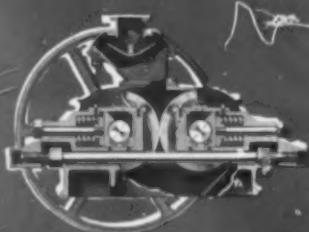
JAW CRUSHERS for coarse, intermediate and fine reduction of hard or soft materials. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.



RING-ROLL MILLS for medium and fine reduction (10 to 200 mesh) hard or soft materials. Very durable, small power. Operate in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes, large or small capacities. No scrapers, plows, pushers, or shovels.



ROTARY FINE CRUSHERS for immediate and fine reduction (1" to 1/4"). Open door accessibility. Soft or moderately hard materials. Efficient. Graduates. Excellent preliminary crushers preceding Pulverizers. Many sizes. Belt or Motor driven.



CRUSHING ROLLS for granulation, coarse or fine, hard or soft materials. Precision and automatic adjustments. Grinding disks balanced. For dry or wet reduction. Sizes 4x2 to 24x20. Roller or Plain bearings. The standard for cleanness.



SWING-SLEDGE MILLS for coarse and fine reduction (1" to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.



MOTO-VIBRO SCREENS screen anything screenable. Classified vibrations. Unit construction—400 capacity. Open door accessibility. Open and close models with or without feeders. Many types and sizes—range of mesh.



STURTEVANT Air Separators Are Stepping Up Production

In cement plants and others, all over the country production has been increasing by leaps and bounds.

Not to be overlooked in these tremendous achievements are the increasing numbers of *Sturtevant Air Separators*.

Installed "On Approval"—None Rejected!

317 *Sturtevant Air Separators* have been installed in the *Cement Industry* "on approval"—not a single one has been rejected. That's proof enough that *Sturtevant* does a real job—can do a real job for you.

Find out how *Sturtevant* gives (1) Range of fineness from 40 to 350 mesh, (2) Capacities of 1/4 ton to 50 t.p.h., while increasing mill capacity as much as 300%, (3) Controlled specific surface area, (4) Lowered mill and product temperatures.

Write for latest bulletin and engineering information now!

STURTEVANT

MILL COMPANY

Harrison Square

Boston, Mass.

3/8" deposit in a single pass



**Bare Electric Stoody Self-Hardening Eliminates Double Pass
Hard-Facing Jobs, Cuts Welding Time.
Saves Scaling and Re-Positioning**

IN a great many cases wearing parts require a deposit of hard metal at least $\frac{3}{8}$ " thick to assure maximum working hours. Where coated rods are used for these hard-applications it is necessary to apply two layers of hard metal to obtain the desired thickness, with a scaling operation between each pass.

Bare Electric Stoody Self-Hardening was developed specifically for heavy applications. While it possesses the same physical characteristics as Coated Stoody Self-Hardening in hardness, toughness, and wear resistance, a $\frac{1}{4}$ " diameter bare rod deposits a bead $\frac{3}{8}$ " thick in a single pass. The use of this alloy not

only saves one complete welding operation, but also eliminates scaling the weld, uses less material and cuts welding time.

Typical hard-facing applications for Bare Electric Stoody Self-Hardening are: Gyratories, roll crusher shells, jaw crushers, swing hammers, grizzlies, sand pump impellers, sand pump casings, baffle plates and shaker pans.

A trial order of 200 pounds at 50c per pound, f.o.b., Whittier, California, will prove the outstanding advantages of $\frac{1}{4}$ " Bare Electric Stoody Self-Hardening for any of the above applications. Orders should be accompanied by priority rating of AA-5 or higher.

STOODY COMPANY

1129 WEST SLAUSON AVENUE, WHITTIER, CALIFORNIA

STOODY HARD-FACING ALLOYS *Stop wear... Eliminate Repair*



DIVIDEND-PAYING EQUIPMENT FOR THE CEMENT PLANT

FULLER-KINYON CONVEYING SYSTEMS
 AIR-QUENCHING CLINKER COOLERS
 ROTARY COMPRESSORS AND VACUUM PUMPS
 FINISHED CEMENT COOLER
 THE AIRVEYOR FOR CONVEYING CRUSHED COAL TO
 PULVERIZERS AND DRYERS
 REMOTE-CONTROL UNLOADER FOR CONVEYING BULK
 CEMENT FROM STORAGE BINS TO BOX CARS, HOPPER-
 BOTTOM CARS, AND PACKER BINS
 ROTARY FEEDERS AND GATE VALVES
 MATERIAL-LEVEL INDICATORS
 SLURRY VALVES . . . SAMPLERS

G-31

FULLER COMPANY

CATASAUQUA — PENNSYLVANIA

CHICAGO—Marquette Bldg.

SAN FRANCISCO—Chancery Bldg.



More yardage broken fewer machine-hours lost

● Continuous, smooth operation of shovels and mucking machines depends to a large extent on the way your material is broken.

Hercomites* and Gelamites* lay down the rock and ore for easy, speedy handling—hold idle machine hours to a minimum.

More of these high-cartridge-count explosives are used today than ever before, because throughout the mining, quarrying, and construction industries their superi-

ority has been definitely established. They are more economical and more effective. Six grades of Hercomite* and two of Gelamite* meet your requirements for nearly all types of blasting.

Thus, to get the maximum production from your present equipment . . . and hold powder costs to a minimum at the same time, investigate Hercomites* (2 to 7) and Gelamites* (1 and 2).

* REG. U. S. PAT. OFF.



HERCULES POWDER COMPANY

INCORPORATED

946 King Street • Wilmington, Delaware

A-50A

LAST YEAR'S BONDS GOT US STARTED

THIS YEAR'S BONDS

ARE TO WIN!

★ Last year saw nearly 30,000,000 workers voluntarily buying War Bonds through some 175,000 Pay-Roll Savings Plans. And buying these War Bonds at an average rate of practically 10% of their gross pay!

This year we've got to top *all* these figures—and top them handsomely! For the swiftly accelerated purchase of War Bonds is one of the greatest services we can render to our country . . . and to our own sons . . . and our neighbors' sons. Through the mounting purchase of War Bonds we forge a more potent weapon of victory, and build stronger bulwarks for the preservation of the American way of life.

"But there's a Pay-Roll Savings

Plan already running in my plant."

Sure, there is—but how long is it since you've done anything about it? These plans won't run without winding, any more than your watch! Check up on it today. If it doesn't show substantially more than 10% of your plant's pay-roll going into War Bonds, it needs winding!

And you're the man to wind it! Organize a vigorous drive. In just 6 days, a large airplane manufacturer increased his plant's showing from 35% of employees and 2½% of pay-roll, to 98% of employees and 12% of pay-roll. A large West Coast shipyard keeps participation jacked up to 14% of pay-roll! You can do as well, or better.

By so doing, you help your na-

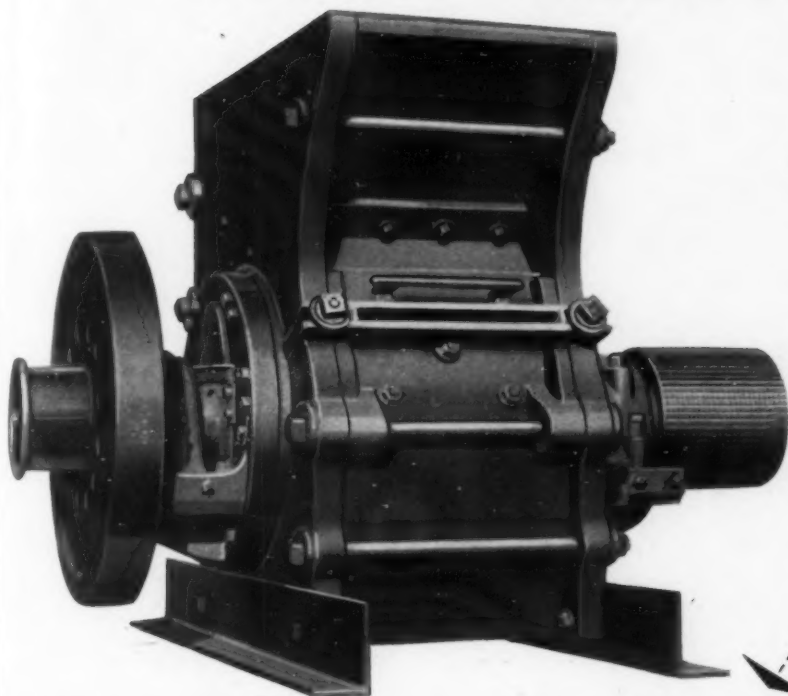
tion, you help your workers, and you also help yourself. In plant after plant, the successful working out of a Pay-Roll Savings Plan has given labor and management a common interest and a common goal. Company spirit soars. Minor misunderstandings and disputes head downward, and production swings up.

War Bonds will help us win the war, and help close the inflationary gap. And they won't stop working when victory comes! On the contrary—they will furnish a reservoir of purchasing power to help American business re-establish itself in the markets of peace. *Remember, the bond charts of today are the sales curves of tomorrow!*

You've done your bit  Now do your best!

THIS SPACE IS A CONTRIBUTION TO AMERICA'S ALL-OUT WAR EFFORT BY
ROCK PRODUCTS

GILSON PULVERIZERS "PASS THE AMMUNITION"...



MOST ACCESSIBLE PULVERIZER BUILT

STURDY CONSTRUCTION

LOW MAINTENANCE COST

LOW POWER COST

LARGE CAPACITY

Lime, and More Lime, For Wartime FOOD Production

PRODUCE YOUR LIME AT LOW COST WITH A GILSON LIMESTONE PULVERIZER



Gilson Pulverizers are in the "LIME-LIGHT." They play a vital part in the production of more food for War Time Necessity.

Gilson Pulverizers are made to "pay out" in the field. They deliver an unequalled capacity of ground Limestone. They operate at low cost. They are easy to service and they are ruggedly built to the exacting material specifications of hard quarry service.

The No. 22, shown here, can be operated either as a Pulverizer or Crusher, and either as a stationary or portable unit.

All parts subject to wear are readily accessible. Adjustments or replacements can be quickly made in the field without removing any major parts. The Gilson No. 22 is built to provide unlimited service at the lowest maintenance.

Built in 5 sizes of 3 to 40 ton hourly capacity for every Production purpose.

Send for complete details and descriptive booklet, now.

GILSON BROTHERS COMPANY
FOUNDRY & MACHINE WORKS
FREDONIA, WISCONSIN

THE *Punch* OF STEAM POWER



Lange Bros., Tehachapi, Cal., here hurry clean-up work with the 2-Cycle Diesel at Quatal Canyon Gypsum Quarry.

The way it purrs in tough going, smoothly, quietly with heavy loads . . . the way it easily handles these big loads with little or no shifting of gears . . . the way it quickly picks up top speed — the 2-Cycle Diesel reminds you of steam power . . . about as close a comparison as you can make with this modern power! No other Diesel tractor performs like it! Handles your stripping, roadbuilding, cleaning-up, hauling and moving of equipment at a new low in cost . . . a new high in speed. Starts instantly, too — no need to let it idle when not in use. Has the stamina to work thousands of tough hours without babying and constant attention, without overhaul or major repairs. Get all the facts on this new kind of Diesel power! Write for literature.

ALLIS-CHALMERS, TRACTOR DIVISION, MILWAUKEE, U. S. A.

ALLIS-CHALMERS
2-CYCLE DIESEL . . THE *Modern* POWER



WE'RE GIVING OUR BOYS A FIGHTING CHANCE



The men and women of MARION are taking this war seriously. They are giving everything they've got to building MARIONS for war work at home and behind the world's many fighting fronts. They are keeping cranes rolling off the assembly lines so that more ships can be built and loaded. They have earned the coveted Maritime Award and Victory Fleet flag. They are investing 10 per cent and more of their pay checks in war bonds month after month. This is how the men and women of MARION are helping to win this war for they, too, have sons, brothers and husbands in the Armed Services to whom they owe a fighting chance. » »

THE MARION STEAM SHOVEL COMPANY, Marion, Ohio, U. S. A.

MARION

SHOVELS • DRAGLINES • CLAMHELLS
CRANES • PORTAL CRANES • WALKERS



WORKING FOR VICTORY: DIGGING — Coal • Magnesium
Iron Ore • Copper Ore • Bauxite • Manganese • Nickel
Molybdenum • Sand & Gravel • Clay
MATERIAL HANDLING — Shipbuilding and Cargo Loading
BUILDING — Airports, Ordnance Plants, Arsenal, Army
Camps, Marine Bases, etc.

Building War Birds

CARL E. NELSON, Logan, Utah
delivers over
100,000 TONS
of Blacktop for the
War Effort in less
than Six Months!

Nests

on Time!

WITH the enemy battering at the door, the whole nation is watching output. High averages are the index to production for Victory. Ninety to one hundred tons an hour average for blacktop production means nests for war birds in a hurry, and it's the best possible evidence of the trouble-free service that Cedarapids Asphalt plants give. That's the daily average of Carl E. Nelson of Logan, Utah with one Cedarapids Asphalt plant on four jobs and in spite of three moves, from widely divergent points.

Iowa Cedarapids plants are simple in design. They are compact, easily moved — even to the great Model E plant, the largest fully portable plant built today — they get on the job and are producing in a hurry! When you buy a Cedarapids, you are buying an asphalt factory engineered to your particular problem from proved units and tested by some of the leading producers of the country.

Wartime performance can teach much for peacetime operation. The advantages that Cedarapids equipment brings for getting the war jobs done will help you meet competition after the "duration."

*It's time to learn about
Cedarapids equipment!*



IOWA MANUFACTURING CO.

Cedarapids

Built by
IOWA

Cedar Rapids, Ia.

CEMENT MIXER SINGIN'



**Boss happy, too, because
Bemis RIP-CORD Closure
Saves so much time
on the job . . .**

ASK THE MAN WHO OPENS THE BAG



If you want proof of the sales appeal and efficiency of the Rip-Cord Closure, ask the man who opens the bag. He'll tell you how a quick jerk opens the closure without damaging the fabric of the bag. This saves time and trouble... increases bag salvage. Rip-Cord closing may be used on any type of cloth cement bag.

The cement worker's melody may be a little off key, but it comes from the heart. For the cement he is using comes in cotton bags closed with Bemis Rip-Cord Closure.

The Rip-Cord Closure can be opened easily without removing gloves . . . without tools . . . without tediously picking at wire or cord ties . . . without damaging the bag. Just a quick jerk on the rip cord and the bag is ready to empty.

Rip-Cord closing is efficient on your production line . . . brings economies on new bags . . . conserves storage space . . . increases the life of multi-trip bags as much as 50%.

Why not look into the possibilities of Rip-Cord economy and sales appeal for your product!

BEMIS BRO. BAG CO.

Better Bags For 85 Years

OFFICES: Baltimore • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Denver • Detroit • East Pepperell • Houston • Indianapolis • Kansas City • Los Angeles • Louisville • Memphis • Minneapolis • Mobile • New Orleans • New York City • Norfolk • Oklahoma City • Omaha • Peoria • St. Louis • Salina • Salt Lake City • San Francisco • Seattle • Wichita

MAIL COUPON FOR COMPLETE DETAILS

Bemis Bro. Bag Co., 410 Poplar Street, St. Louis, Missouri
Please send complete details on
efficient Bemis Rip-Cord Closures.

Name

Company

Street

City State

CP Sinkers Can take it—



JUST GIVE THEM ORDINARY CARE

FEW hand-held drills are as well designed, as ruggedly built as CP Sinker Drills. You don't have to handle them with kid gloves or baby them on the job. But, you do have to give them reasonable care, and a few simple suggestions — like the four illustrated on this page — will help you to get maximum service from your CP-32, CP-42 and CP-10 Sinker Drills. Additional suggestions for the better maintenance of CP Sinker Drills will appear in future advertisements. Watch for them.

HOW TO GET MAXIMUM SERVICE FROM YOUR CP SINKER DRILLS



1 Remove, clean air inlet screen every two weeks — more frequently if hose is old. Drill will lose power, if the air inlet screen becomes clogged.



2 Fill reservoir with good grade of oil of proper viscosity for weather conditions. If machine is used constantly, fill the reservoir every hour.



3 Before putting sinker drill in service, always connect the air hose and make sure oil is coming through the machine and out of the exhaust.



4 Blow air hose, connect to machine, turn on air and examine drill abank to see whether oil is going through working parts of the machine.

★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Nicycle...Universal)
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY

General Offices: 8 East 44th Street, New York, N. Y.

★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES



Of every 10 Mack trucks built ten years ago—7 are still doing duty! Here Peter Helck sketches a "baby Mack" at dock-side.

ITS MIDDLE NAME IS . . . WORK!

Today's Mack trucks range in size from tough little one-tonners to the biggest Prime Mover in Uncle Sam's Army. But big or little—if its last name is Mack, its middle name is *work!*

For 43 years, the world has watched the way Mack trucks wade into the toughest jobs in trucking. That is why the phrase "Built like a Mack truck" is a part of our language.



Mack Trucks, Inc., Long Island City, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.



Mack

TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

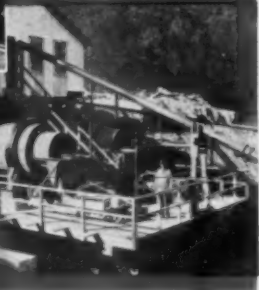
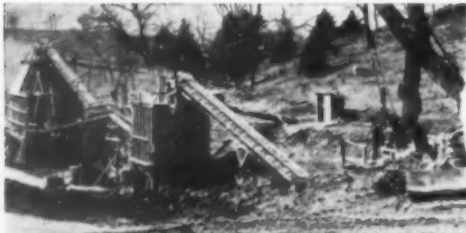
— BUY U. S. WAR BONDS —

IF YOU'VE GOT A MACK, YOU'RE LUCKY . . . IF YOU PLAN TO GET ONE, YOU'RE WISE!

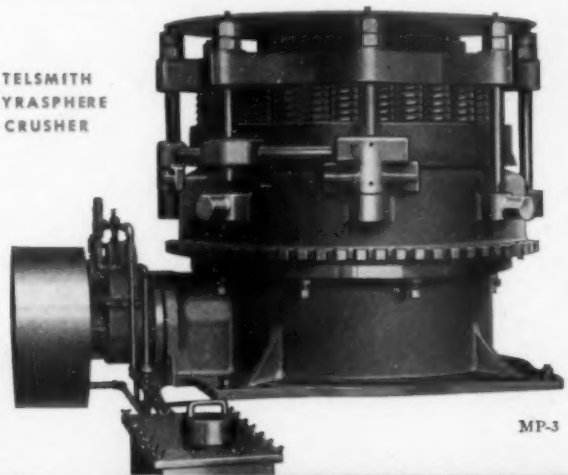
FOR WAR WORK Aggregate Plants ...by

TELSMITH

Like hundreds of Telsmith plants all over the world, these recent rock crushing and gravel washing plants have operated smoothly, efficiently and profitably right from the start. Most of them are doing war work, where the production pressure is tremendous. A Telsmith plant means the latest in equipment—crushers to bin gates—Telsmith-designed-and-built for extra staying power, greater flexibility and capacity, lower operating and upkeep costs. And Telsmith *Balanced* Engineering Service and centralized responsibility fits that plant to your own particular needs. Write for Bulletin EP-11.



TELSMITH
GYRASPHERE
CRUSHER



MP-3

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London
 Room 1604—50 East 42nd St. New York City
 211 W. Wacker Drive Chicago, Ill.
 713 Commercial Trust Bldg. Philadelphia, Pa.
 19-21 Charles St. Cambridge, Mass.
 G. F. Seeley & Co. Toronto, Ont.
 Mines Eng. & Equip. Co. San Francisco—Los Angeles
 Brandeis M. & S. Co. Louisville, Ky.
 Charleston Tractor & Eqt. Corp. Charleston, W. Va.
 Roanoke Trac. & Eqt. Co. Roanoke, Va.
 Clift L. Priester 911 S. 3rd St., Memphis, Tenn.
 Wilson-Weener-Wilkinson Co. Knoxville and Nashville, Tenn.



This simple test
shows how the Concave Side
Cuts Belt *and* Power Costs!

Have someone bend a V-belt exactly as it bends in going around its pulley. As it bends, grip its sides with your fingers. You will *feel* those sides *change shape*. If the sides were straight before bending, they become *convex* as the belt bends. (See Figure 1 on the right.) Note how the sides *bulge out*.

Now try the same test with a belt which has the patented Concave side. You will feel the *same shape change*—but what a *different result*! The sides do not become *convex*. They become perfectly straight. The bent belt has a shape that exactly fits its sheave groove—as shown in Figure 2.

Two savings result. **FIRST:**—There is no side-bulge and this means uniform sidewall wear—*longer life*! **SECOND:**—There is a full side-width grip on the pulley and this carries heavier loads without slippage—saving the belts and also saving your power!

Only belts built by Gates are built with the Concave side, which is a Gates patent.

THE GATES RUBBER COMPANY
Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL.
549 West Washington

NEW YORK CITY
215-219 Fourth Avenue

ATLANTA, GA.
738 C. & S. National Bank Building

LOS ANGELES, CAL.
2240 East Washington Boulevard

DENVER, COLO.
999 South Broadway

DALLAS, TEXAS
2213 Griffin Street

PORTLAND, ORE.
333 N. W. 5th Avenue

SAN FRANCISCO, CAL.
1090 Bryant Street

What Happens
When a
V-Belt Bends



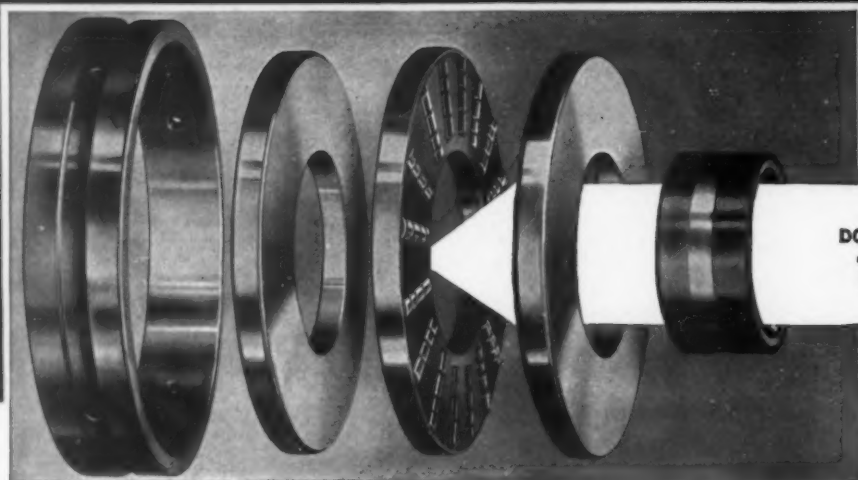
FIG. 1



FIG. 2

434

When Every Machine Must Do 3 Machines' Work!

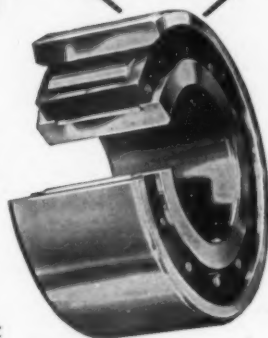


°Type SDT
DOUBLE ACTING
THRUST

°Type MCS
DOUBLE
WIDTH
RADIAL

These simpler **ROLLWAY** **RIGHT-ANGLED BEARINGS**

hold "down time" losses to a minimum...



Not one shift, not two shifts, but **THREE SHIFTS A DAY!** That's the three-machine load your equipment must handle today. No wonder bearing wear increases. No wonder old-time service factors fail to predict bearing life. But even with this tripled operating time, there's a way to carry bearing loads that will make your bearings stand up longer. Here's the fundamental principle to follow:

Right-Angled Bearings Simplify the Load

Because they carry every load at right angles to the roller axis, Rollway Right-Angle Bearings split the load into its two simple components of *pure radial* and *pure thrust*. Only one of these loads is carried by a single bearing assembly. There are no oblique resultants, no compound pressures on the rollers. Magnitude of the stresses is considerably reduced. Life of the bearing is substantially increased. And machines can be run under heavier loads for longer periods.

Standard Sizes For Most Applications

S.A.E. or American Standard metric dimensions and tolerances are available for most applications... in a wide range of sizes and types that are "engineered to the job." Let Rollway's specialized bearing experience help you. Send your design or change-over specifications for free, confidential bearing analysis and recommendation. No obligation.

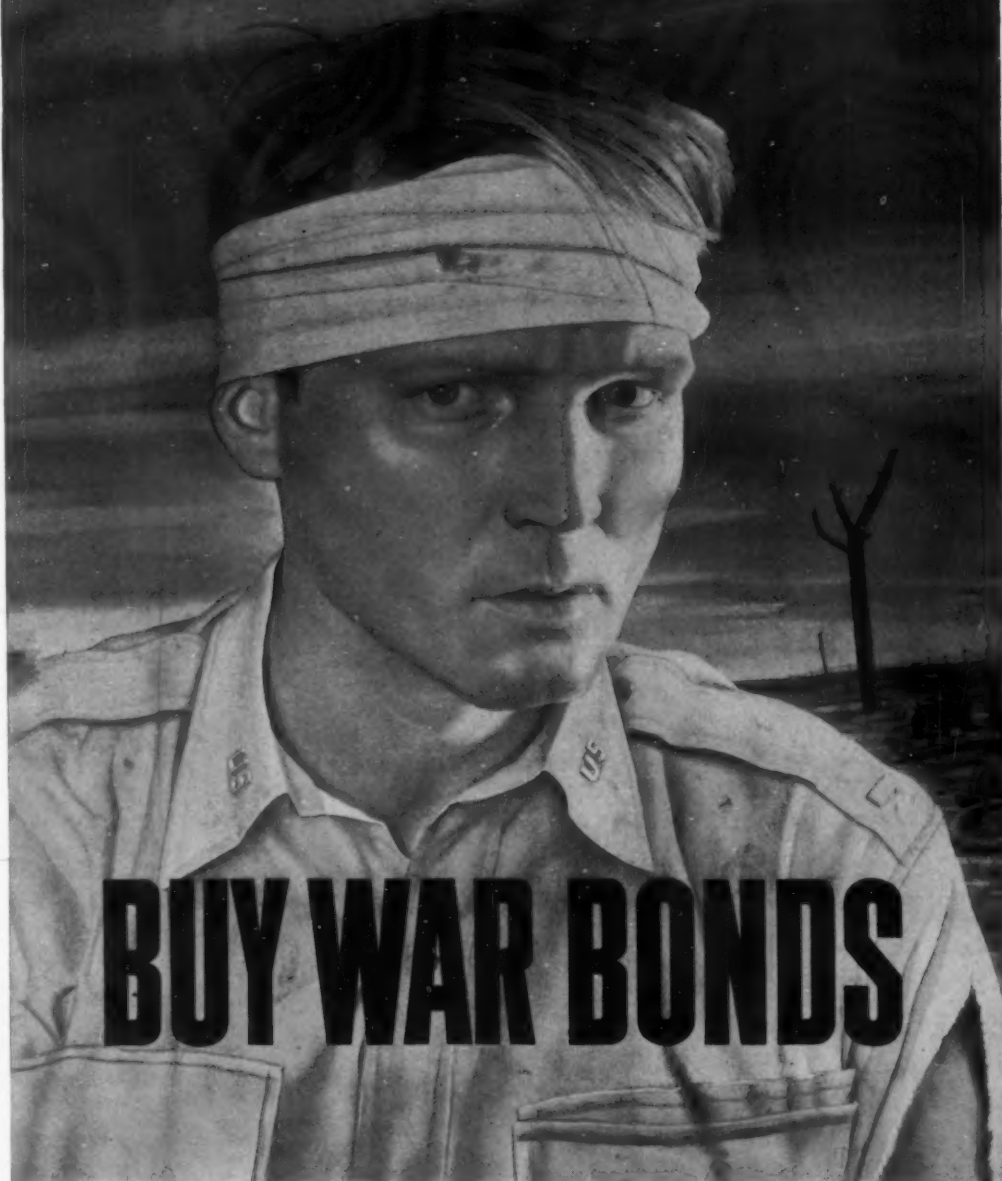
ROLLWAY

BEARING COMPANY, INC., SYRACUSE, NEW YORK

BUILDING HEAVY-DUTY BEARINGS SINCE 1908

BEARINGS

"Doing all you can, brother?"



BUELL ENGINEERING COMPANY, Inc.
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During the first decade of its existence, ROBINS conceived and introduced 41 innovations in the field of materials handling methods and machinery.

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- THE FIRST belt feeder
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- THE FIRST rotary stone grizzly
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MATERIALS HANDLING MACHINERY

Rock Products

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FROZEN PLANTS?

ADD SOON to frozen wages and salaries, frozen plants—plants shut down for the duration, either voluntarily or by W.P.B. edict. We have in mind, of course, rock products plants, although they are no different from many others in industries operated primarily for civilian economy. For almost two years now our construction needs for a war economy have been very great, and while numerous producers and manufacturers did not share in this business, on the whole it called for the greatest volume of construction materials ever required in an equal period of time.

The rock products industry has risen to the occasion in remarkable fashion, supplying all requirements with little or no increase in prices, in spite of much higher costs, and very largely from existing plants with only ordinary replacements and repairs. The time is here, however, when construction for war economy is slowing up, and apparently there soon will be considerable unused plant capacity for the duration, unless the W.P.B., or some other agency, organizes civilian requirements so that these can be met.

There are signs that W.P.B. can no longer turn down all highway reconstruction projects and expect the state highway systems to carry the traffic demanded of them for war purposes. For example, under threat of the governor to close parts of Route 66 between Chicago and St. Louis, as impassable, the W.P.B. rescinded its previous order, and is permitting Illinois to proceed with fairly extensive reconstruction and repavement. Presumably there are or will be many similar instances, so that while highway construction will continue to be at a minimum, there still will be considerable demand for rock products. Railway ballast also will be required and chemical and metallurgical limestone must be quarried and crushed. Foundry sands and sands for other industrial uses are in great demand on account of the war.

We have discussed the possibility of "nucleus plants" in these columns before, and they have been informally discussed by leaders in this industry, but rather half-heartedly. We suggest that the time has come to discuss them seriously. Some well-posted men in the industry think the situation will largely take care of itself, that shortage of business, of labor, of repair parts, etc., will cause the gradual closing of "the weak sisters". In the interests of the future of this industry and in the interests of the "New Social Order" that seems likely to grow out of present difficulties, we don't believe this should be settled by a "do-nothing" attitude on the part of this industry—or for that matter any industry similarly affected.

An exclusive, copyrighted article in the April 11 (Sunday) issue of the *Chicago Sun*, from its Washing-

ton, D. C., bureau, apparently contained some inside stuff on W.P.B. plans for "industry concentration." Since then Donald M. Nelson, chairman of W.P.B., has said this story was based on confidential preliminary reports of a committee that has since been disbanded, and its plans "abandoned, for the present at least." Nevertheless, Mr. Nelson said a new committee might be appointed "to make a fresh start on concentration studies"; he said the conclusion was inescapable that the problem was very complicated because of the interdependence of one industry on another.

One of the alleged objectives was to avoid fostering "post-war domination" of the industries by a few producers, which would prevent re-entry of small operators; so, as far as possible, small producers were to be favored. Another objective was to avoid unnecessary cross-hauling. It is certainly good public policy, although possibly not to the present advantage of large operators, to preserve the small independent producer in all industries. Our system of free enterprise requires this.

Producers generally have taken the stand that they could do nothing themselves toward organizing their industries locally to accomplish the same purposes that W.P.B. has in mind, for fear of violating the anti-trust laws. Nevertheless, it will be a sad day for private enterprise, if producers do not take the initiative and work out something that will be satisfactory to the W.P.B. as well as to the industries involved. Altogether too frequently in recent years private enterprise has let Washington take the initiative away from it by extra-legal means. It is time private enterprise stretched the law a little, especially when it can do so in the public interest.

It would be the height of folly to set up any scheme of nucleus plants which did not consider a great many more factors, than a few schemers in Washington can possibly take into account. For example, these are all service industries as well as production industries. The question of quality of product is also quite as important to the public as efficiency of production in the matter of volume at low price. The ultimate measure of efficiency is in the durability and life of the end-product—such as a concrete pavement—not the volume that the aggregates plant is able to turn out for the least cost. The way to work out such problems is within the industry and not by ignorant tampering of incompetent bureaucrats.

Nathan C. Rockwood

HINTS AND HELPS

Lime Kiln Used as Lathe to Smoothen Rollers

AMERICAN LIME & STONE CO., Bellefonte, Penn., has developed an interesting scheme to take out the "wrinkles" on the rings of the lime kiln so that they will ride smoothly on the supporting rollers. The rotary lime kiln itself serves as a lathe. The illustration shows Olaf Risan, chief machinist, doing the job. A portable post holds the cutting tool against the ring, cutting away the ridges to provide a smooth surface. Like a



Portable tool to cut away ridges on lime kiln rings uses turning kiln for power

lathe, the cutting tool moves in a horizontal plane as the kiln turns, and pressure is applied to the tool by hand through a screw and ratchet wrench to adjust the depth of cut. The portable tool is firmly supported from the floor by heavily braced steel angles and T sections welded together.

Concrete Lining for Sand Pumps

AN UNUSUAL USE of concrete is mentioned in a recent issue of *Engineering and Mining Journal* which may have an application in the rock products industries. As a substitute for steel and rubber linings, Eric W. Johnson, mill superintendent of Island Mountain Mines Co., Ltd., Wells, B. C., experimented with concrete as a lining material for a Wilfley sand or slurry pump. The plate on the

pump side was removed and when the worn lining was taken out, pieces of $\frac{1}{2}$ -in. square mesh, 16-gage wire screen were cut to fit the inside walls of the pump case. With these pieces of screen as reinforcing material, a thick concrete paste was then applied to the case and the plate, care being taken to reproduce as nearly as possible the contours of a new rubber lining.

Galvanized iron was used for the inside wall of a form for the main part of the case; and for the plate, galvanized iron was used for the outer part of the form, and a bucket for the inner wall. Concrete was mixed as follows: $\frac{1}{2}$ cement, $\frac{1}{4}$ silica sand, $\frac{1}{4}$ washed gravel, minus 3, plus 10 mesh in size, and, after applying, the mixture was allowed to set for a day before the forms were removed. When the parts of the case were fitted together, excess concrete was scraped away and fresh cement was added to seal the joint. The lining was then allowed to set for 28 days before the pump was put into use. On examination after $2\frac{1}{2}$ months' service, very little sign of wear was found in the concrete lining and no grooves had been worn despite the passage of 10,746 dry tons of ore through the pump during that period.

Pan-Type Bin Gate From Pipe Sections

PORTER W. YETT, Portland, Ore., is one of the largest sand and gravel and crushed stone producers of the Pacific Northwest. In filling a recent large contract for hot bituminous mix for shipyards, airports, etc., he has devised some interesting equipment. One of these devices is a pan-type bin gate made from pipe sections which permits close control of the flow of materials. As shown in the illustration, it consists of a section of 8-in. steel pipe extending down from the bin compartment. Near the bottom of this pipe a semi-circular pan-type gate has been formed from a plate of steel projecting horizontally at each side of the vertical pipe. This pan-type gate is attached near the bottom of the vertical steel pipe spout by a bolt which permits the pan to be tipped forward by means of a rod welded to the pan. Back of the pan is a vertical steel rod with holes drilled into it so that a steel pin may hold the pan in any desired position,

thereby controlling the flow of material to the belt. No material flows out when the pan is in a horizontal position. An interlocking electrical



Specially designed, pan-type bin gate to control feed to belt conveyor

system controls the belt conveyor in case there should be an emergency plant shut down.

Efficient Long Booms

By W. C. TORBETT, JR.

IN THE OPERATION of a gravel pit, there are some things that not being seen, are never noticed; and yet these very things will in some cases be the difference between profit and loss. An important cause of one of these apparently invisible losses, is the boom on the machine that is used to strip overburden.

In selecting a machine, the proper bucket size along with the boom length should be considered and used at the outset. In considering the length of the boom several factors must be known; the width of cut, the depth of the overburden, and the depth of the deposit. If the overburden is to be hauled away, this is probably not as important, as where the overburden is cast into the worked cut. For an example, the open cut method will be cited. The overburden is dumped into the cut worked out, with a dredge following the dragline, and the material is pumped to the screening plant, as shown in the illustration.

In handling dirt, the proper bank slope must be left to keep the material from caving. A 1-to-1 slope is commonly used, but in stripping a

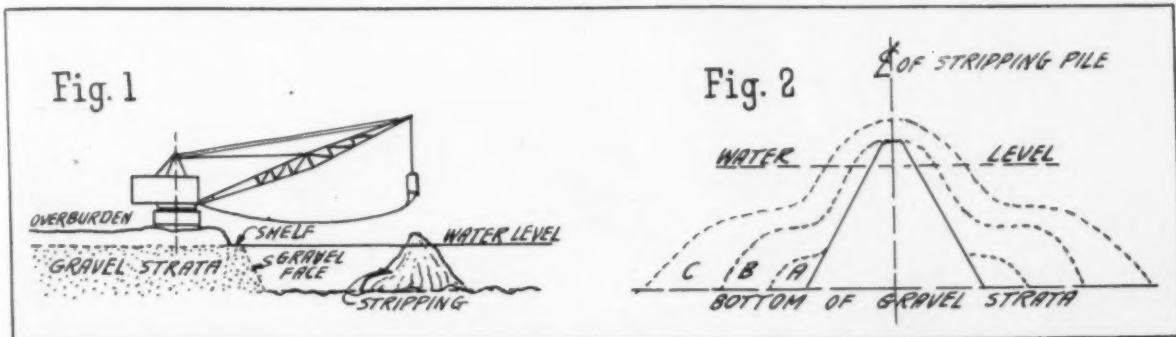


Fig. 1: Proper method of stripping and handling of material to secure the maximum recovery from a dredge pump. Fig. 2: Shows by the dotted lines how the overburden continues to mushroom out, while under water, as more stripping is piled

2-to-1 slope can be left, and not cause any trouble. This means that for every two feet of dirt removed, the base should be one foot wider than the top. Thus if the depth of overburden is six feet, it would take a three foot wider base to keep this from caving. Then if the deposit is a relatively shallow one, as in some sections of the South, say 20 ft., with the water level at the top of the gravel deposit, the lay of the gravel on the bank side will be about 10 ft. out into the water, at the bottom. This will give a total distance of 13 ft. from the top of the ground to the bottom of gravel, that the dragline must clear, with its load of stripping, to avoid having an invisible loss. If the boom is so short that the overburden can not be cast beyond that base, then a large percentage of the deposit is lost, because it is covered with strippings.

When dumping into water, a greater allowance must be made because of the mushrooming of the overburden when it hits the water. As the material is dumped from a height above the water, it does not stack up, but continues to spread until nearly the whole cut is filled or until the material will carry additional weight, and then it begins to pile up. This additional weight will force the bottom layers to spread until they strike some obstruction; if nothing else, it will be the clean gravel bank, on the bank side that was left from the previous cut. If the boom is not long enough to cast beyond the center of the previous cut, this mushrooming will cause the loss of some of the material on the bank side, but if the center of the pile is beyond center, the under-water material will run towards the other side, and the soup or muck that will be near or against the clean gravel face, can be handled through the plant with no trouble. At the ends of each cut, this condition

will be noticed by the muck rising to the surface, and if it is not forced along the cut, and to the back side by dumping ahead of it before the stripping pile is closed, it will lay against the gravel face and cause trouble. The width of the cut desired is important in that by taking wide cuts, for a given area, the dragline can spend more time actually moving dirt, and less time moving in from one cut to the other, as there would be fewer cuts.

Increasing Capacity of Draglines

It is generally found that the smaller draglines will move nearly as much dirt as a machine twice its size, with a boom twice as long. Thus if you take a 3-cu. yd. machine with a 100-ft. boom, it will not move so very much more dirt than a 1½-cu. yd. machine with a 50-ft. boom. Any machinist could tell you why this is so; as the ft. per minute of travel at the point of the boom, during the swing, should be constant, the same as the speed of a piece of steel in a lathe. The small piece of steel can have a higher r.p.m. to keep the circumference or rim speed correct, while the large piece must have its r.p.m. reduced to give the correct rim speed. Thus we have the same condition with reference to the travel of the point of the boom. With the long boom, the swing speed must be slower than the short one, and as the swing is the factor that makes a cycle fast or slow—the bucket loading time is about the same for both size machines—that is where the short boom machines can hold their own. For the above reasons, some producers look at the cost of the small machines over the large ones, and only figuring on "yards moved" purchase the small machine, and then begin having the "invisible losses."

During stripping, if a dredge is

being used to mine the material, it has been found profitable to leave a shelf of gravel next to the bank side. This shelf will permit any overburden that caves off to rest at this point and during the stripping of the next cut, the dragline can re-clean this shelf, if the boom is long enough, and insure a high percentage of clean reclaimable material. Fig. 1 shows the proper method of stripping, and handling of material to insure the greatest recovery with a dredge pump.

Even where there is no overburden, and the dragline is used to load into a hopper or trucks, if a producer wishes to get the maximum from his deposit, it would be profitable to check his depth of material, before selecting his dragline. If the boom is too short, by the time the bucket has traveled its two to four times its length, to fill, it might be so close to the machine, that when a certain depth is reached, it would be dangerous for the machine to remain any longer in that position, because of the caving bank. Thus again, we have the condition of a lot of material being lost because of a short boom.

If these deposits were not natural resources, this would not matter, as on the second trip over the lease all wasted material could be reclaimed, but since once over an area, that is the end of it for production; then producers, in order to remain in business as long as possible, should analyze their deposit, and see if this invisible loss is happening. If the large, long-boom machines cost more, and an operator is planning on a long-time operation, and not a way-side pit proposition, it will usually pay to have the extra boom length. This boom can be shortened by raising it up, but to reach out after that extra width that will be wanted at some future time, with a short boom is impossible, and will usually turn out the most expensive investment.



New N.R.M.C.A. President

STEPHEN STEPANIAN, vice-president, Arrow Sand and Gravel Co., Columbus, Ohio, was elected president of



Stephen Stepanian

the National Ready Mixed Concrete Association, at a special meeting of the Association's board of directors in New York City on April 16. He succeeds H. F. GARVIN PELSUE, who resigned because he is no longer in the ready mixed concrete business. Mr. Stepanian has been prominent in the Association since its organization. He designed the first truck mixer, as described in *Rock Products*, April, 1941, p. 69, so in a real sense he is a "daddy" of the industry.

Returns from Abroad

STANLEY F. PLACHECKI, who has been engaged in the lime and limestone industry as plant superintendent and manager, is now equipment analyst for the Aluminum Company of America, Pittsburgh, Penn. Mr. Plachecki recently returned from overseas service in the British Isles

locating and opening up a number of quarries for a large construction job.

Joins Metropolitan

H. F. G. PELSUE, vice-president of Graham Brothers, Inc., Los Angeles, Calif., has been appointed general manager of the Metropolitan Sand and Gravel Corp., New York, N. Y. Mr. Pelsue joined Graham Bros. in 1922 as a truck driver, and operated the only one man sand plant in existence on Signal Hill, Long Beach, Calif. He turned to selling and subsequently became sales manager. In 1933 Mr. Pelsue was appointed executive secretary of the Regional Committee for California and Nevada under the mineral aggregates code of the N.R.A. He became vice-president of Graham Bros. in 1935. Mr. Pelsue, who has been president of the National Ready Mixed Concrete Association, resigned recently as his new company is not engaged in the ready mixed concrete business.

Retires

LOUIS A. SCEURMAN, master mechanic at the Universal Atlas Cement Co. plant, Hudson, N. Y., has retired after 34 years of service. He was presented with a United States War Bond by fellow employees in the mechanical department.

F.W.A. Change

C. W. ANDERSON of St. Paul and Marshall, Minn., has been named regional Federal Works Agency director for Region 6, with headquarters in St. Paul. He succeeds Ezra B. Curry, acting director who resigned to become associated with the Northwest Airlines.

THOMAS FOWLER, associate regional engineer for the Federal Works Agency, 6th Regional District, St. Paul, Minn., has resigned to enter service with the Navy. He will be a civil engineer with rank of lieutenant commander.

Dist. Eng. Bureau of Mines

RICHARD W. SMITH, formerly mineral technologist with the southern experiment station of the U. S. Bureau of Mines, Tuscaloosa, Ala., has been appointed district engineer for the Bureau's fifth district, eastern region, in charge of field work in Alabama and Mississippi. Mr. Smith will continue to make his headquarters at Tuscaloosa.

Sales Manager

ROBERT H. MORSE, JR., assistant sales manager, Fairbanks, Morse & Co., Chicago, Ill., is now general sales manager.

Promotions

N. R. KNOX, vice-president of Bucyrus-Erie Co., Milwaukee, Wis., has been elected president of the company. He succeeds W. W. COLEMAN, president for 32 years, who will remain as chairman of the board of directors. G. A. MORRISON, vice-president, was elected vice-chairman of the board, and W. L. LITTLE, works manager at Erie, Penn., was named vice-president.

N. A. McGrath was re-elected secretary and J. G. Miller, treasurer. Appointed officers now include W. M. Bager, technical director; D. P. Eells, vice-president with special assignments; P. H. Birkhead, vice-president in charge of the sales department; R. W. Newberry, vice-president in charge of the commercial department; C. K. Charlton, assistant to the president. The senior officers will continue to devote full time to the company's affairs, but the changes will give increasing responsibility to younger members of the organization.



N. R. Knox

ROCK PRODUCTS

NEWS ABOUT PEOPLE

New Chief Engineer

ORIN L. KIPP, assistant chief engineer and planning engineer of the Minnesota Highway Department, has been appointed assistant commissioner and chief engineer, succeeding the late J. T. Ellison. Mr. Kipp has been connected with the Minnesota Highway Department since 1914.

Leaves Highway Dept.

ROBERT ALEXANDER HARRIS, chief engineer for the Mississippi State Highway Department since 1934, has been commissioned a lieutenant-commander in the United States Navy Reserve. Mr. Harris, who has been with the highway department for 23 years, has been granted leave of absence for the duration and in his absence his work will be carried on by other members of the engineering staff.

Accepts B. E. W. Position

G. E. HOPKINS, formerly technical director, U. S. Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Penn., has accepted an appointment with the Board of Economic Warfare.

Sons in the Service

GEORGE C. WALTER, president of the Southern Cement Co., Birmingham, Ala., has reasons to be proud of his sons, CAPTAIN CHARLES W. WALTER and MAJOR GEORGE C. WALTER, JR. Captain Walter, who formerly represented the Southern Cement Co. in south Georgia and north Florida, was decorated with the Silver Star for gallantry in action during landing

operations in North Africa, and Major Walter is with the 12th Army Air Corps in North Africa.

With the Army

ARNOLD SOBEL, maritime superintendent for the Material Service Corp., Chicago, Ill., is with the U. S. Army overseas.

MELVIN F. MUNCH, formerly assistant chemist for the Oregon Portland Cement Co., Portland, Ore., has been commissioned a 1st Lieutenant and is stationed at Camp Bowie, Texas.

HARRIS V. FEGELY, assistant superintendent, Monarch Cement Co., Humboldt, Kan., is in the Army's officer candidate school.



R. E. Allen

In the Air Service

R. E. ALLEN, purchasing agent and plant engineer, Metropolitan Sand and Gravel Corp., Port Washington, N. Y., has entered the Armed Forces. He is now stationed at the Army Air Corps Training School at Jefferson Barracks, Mo.

Awarded Medal

HARRY EDMUND NEWELL, assistant chief engineer of the National Board of Fire Underwriters, New York, N. Y., was awarded the James Turner Morehead Medal for 1941 for his "leadership in developing standards for installation and operation of acetylene equipment and systems," at a recent dinner at the Union League Club. The Morehead Medal is given annually by the International Acetylene Association in honor of the late James Turner Morehead, who sponsored the experiments which led to the discovery in 1892 of the modern electric-furnace method of producing calcium carbide, from which the acetylene industry has sprung.

Named Chairman

HENRY J. KAISER, president, The Permanente Corp., Oakland, Calif., was recently named chairman of the board of directors of Brewster Aeronautical Corp., New York, N. Y.

In the Navy

R. B. HINDMAN, formerly field engineer for the Lehigh Portland Cement Co., Allentown, Penn., is now executive officer and material officer in the United States Navy.



Capt. Chas. W. Walter

New Superintendents

FERAL H. JOHNSON is now superintendent of the bauxite mines of the Reynald Mining Co., Little Rock, Ark.

CHARLES P. VAN GILDER, a graduate of the Colorado School of Mines, is superintendent for the Victoria Gravel Co., Terlingua, Texas.

EARL N. PIXLEY of Delevan, N. Y., has succeeded Harry W. Vickery as superintendent at the Franklinville, N. Y., sand and gravel and farming operations of The Buffalo Slag Co., Inc., Buffalo, N. Y.

H. LAMONT is the new superintendent of the Gulf Portland Cement Co., Houston, Texas, which is a subsidiary of the Ideal Cement Co.



Major Geo. C. Walter, Jr.

PLANT EXPANSION

More Cement for Puerto Rico

Ponce Cement Corporation will increase capacity of plant completed in 1942 by installation of new kiln and grinding mill

By JOSE A. FERRE*

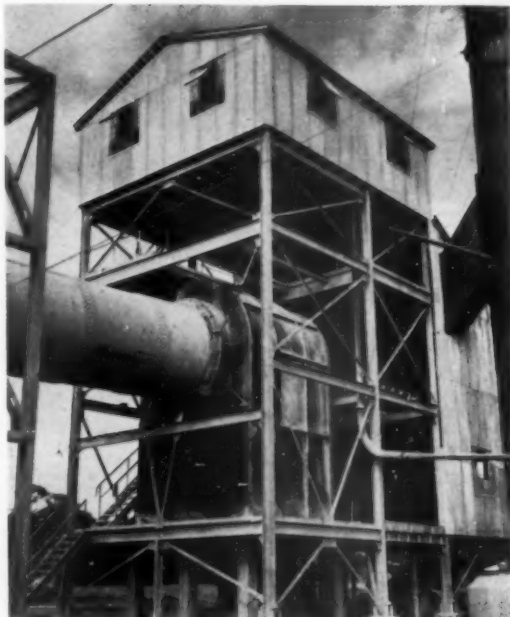
ABOUT ten years ago, General Blanton Winship was appointed Governor of Puerto Rico by President Roosevelt. Soon after he became Governor of Puerto Rico, he decided that the only way to bring happiness to the two million Puerto Ricans was to start a program of industrialization for the Island.

Among the things that he thought should be done was to develop the cement industry. Governor Winship was soon able to interest Mr. Franks of the National Portland Cement Company to look into the matter of developing this industry in Puerto Rico.

Mr. Franks and his associates

*Secretary and co-managing director, Ponce Cement Corporation.

Feeding end of kiln, showing steel structure supporting machinery



made several trips to Puerto Rico looking at different sites and meeting many of the business men of the Island brought together by Governor Winship. Nothing came out of these meetings as the Federal Government stepped in and decided that they would advance money to a Puerto Rican corporation, owned by the Insular Government, to build the first cement plant on the Island. Governor Winship's efforts then went on

to help the Federal Government in putting up this plant, and soon afterward, the Puerto Rico Cement Corporation came into being, with Governor Blanton Winship as its first president.

Among the men of Puerto Rico who had been asked to attend the original meetings called by the Governor to develop the cement industry in Puerto Rico, were Agripino Roig and the writer. A few years after the



General view of plant buildings, Ponce Cement Corporation, Ponce, Puerto Rico. Quarry protects plant from north and east winds

PLANT EXPANSION

Government cement plant went into operation, when additional cement production became necessary to take care of Puerto Rico and that part of the Caribbean area surrounding Puerto Rico, the Roig and Ferre families decided again to explore the possibilities of a private cement plant in Puerto Rico.

Sometime during the middle of 1941, the Ponce Cement Corporation was organized with Antonio Ferré as president, J. Adalberto Roig as vice-president, Agripino Roig, director, Antonio A. Roig, Jr., director, Luis A. Ferré, treasurer, and José A. Ferré, secretary. Mr. Luis A. Ferré was appointed co-managing director in charge of production and all technical matters and José A. Ferré was appointed co-managing director in charge of the business end. They both came to New York in June, 1941, and purchased all the machinery for the cement plant. Just about a year later, in August, 1942, the first cement was made, and up to the present writing, over 130,000 bbl. have been produced and marketed, most of which has gone to Army and Navy projects in Puerto Rico and the Caribbean area.

The design and erection of the plant was assigned to the Porto Rico Iron Works, Inc., under the direct supervision of Luis A. Ferré. Porto Rico Iron Works was greatly helped in designing the plant by Andrew P. Hachtmann and also by the Technical department of F. L. Smidth & Co., although the larger part of the credit for the actual designing of the



Concrete slurry tanks to the left; power substation, pack house and cement silos, to the right

plant should be given to Mr. Hachtmann who did splendid work under the supervision of Co-Managing Director Luis A. Ferré.

Equipment

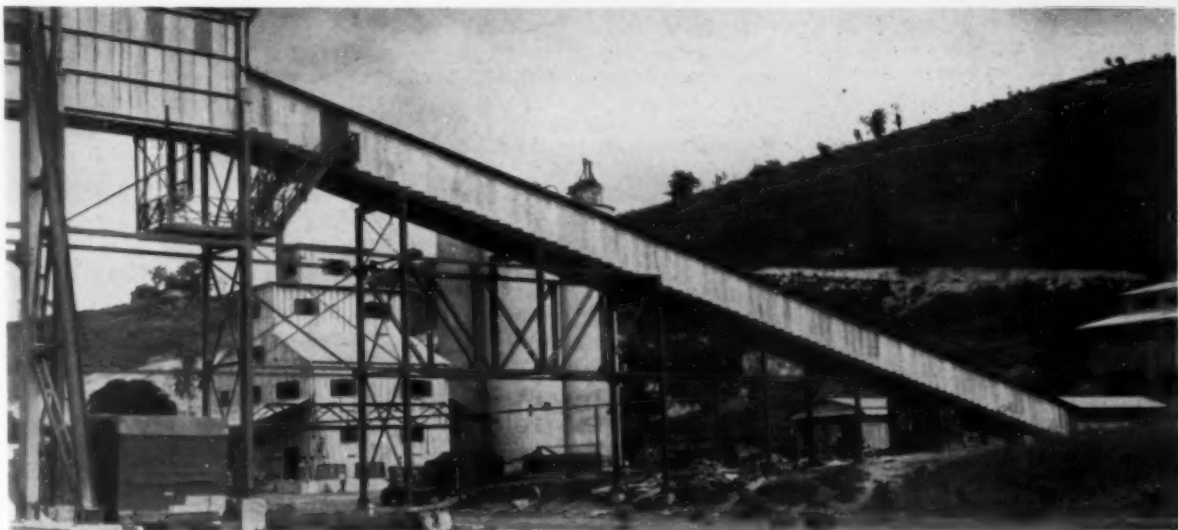
With time being a very important factor because production of cement was greatly needed by both the Army and Navy, it was decided to purchase an existing kiln from the Lawrence Portland Cement Company. This kiln had been in use only a few weeks so that it was practically new. To increase kiln efficiency and also to bring its capacity to 1200 bbl. per day, a Smidth heat recuperating induced draft fan system was installed. A Fuller grate-type cooler was connected to the discharge end of the

kiln to effectively cool the clinker and utilize the heated air from the cooler for preheating the primary air, thus improving the kiln fuel efficiency.

The grinding installation consists of two new 7 ft. 3 in. by 29 ft. Smidth Unidan mills, one for slurry grinding and one for clinker grinding. Each mill is arranged to be driven by 600-hp. motors.

Limestone is quarried by drilling and blasting and is then loaded in trucks which take the stone a short distance to a 150-hp. Pennsylvania hammermill. After the preliminary crushing, the crushed stone is conveyed by means of a belt conveyor to the storage building.

Clay is washed in an Allis-Chal-



Belt conveyor, to the right, to convey crushed limestone from the crusher house into the plant; packing house and silos in background. Note that all construction is of concrete and steel



Interior mill building. Concrete wall to the right forms part of various concrete bins for crushed limestone, gypsum, sand, and iron ore

mers wash mill. The clay slurry flows by gravity to two storage basins.

The slurry is ground in a 7 ft. 3 in. by 29 ft. Smidth Unidan mill. Limestone, sand and iron ore are weighed and fed to the mill by three Schaffer Poidometers. Clay slurry is also added at the inlet of the mill, the amount being such that a satisfactory titration can be obtained.

Wilfley pumps deliver the slurry to four 600 bbl. slurry tanks equipped with Dorr agitating devices. After the blending and correction in these tanks, the slurry is stored in a 6,500 bbl. Dorr basin.

Oil-Fired Kiln

Slurry is fed to the 9- x 180-ft. rotary kiln by means of a Smidth spiral scoop feeder, which is synchronized with the speed of the kiln motor. The dust chamber is equipped with a special Smidth tightening device which prevents the admission of atmospheric air to the induced draft system. A 50-hp. FLS induced draft fan creates the required draft and discharges the kiln gases into a 9- x 150-ft. steel stack. The kiln is fired with oil by means of a Schutte-Koerting oil firing system. Clinker, cooled in the inclined grate cooler, is conveyed to the storage building. Grinding of clinker is done in the Smidth Unidan mill, previously mentioned.

A Fuller-Kinyon pump system transports the ground cement to the packing house where it is packed into bags by two Modern packing machines.

Capacity of the different units is as follows:

Pennsylvania Hammermill, 3000 bbl. per day.

Slurry Mill, 2000 bbl. per day.

Clinker Mill, 1400 bbl. per day.

Kiln, 1200 bbl. per day.

Three 75-hp. Chicago Pneumatic compressors provide the necessary amount of air for the slurry basins and for the drills in the quarry.

The laboratory is provided with up-to-date equipment so that all analyses and tests required to manufacture standard and special cements can be made at the plant.

All the motors were built by Allis-Chalmers. Belting and packing was made by B. F. Goodrich Co. Conveyors and elevators were made by Chain Belt Co. and Stephens-Adamson Manufacturing Co.

In the quarry department, Allis-Chalmers tractors with bulldozers are used with two Lorain shovels and ten White dump trucks. Transportation of the finished cement to the consumer is by means of a fleet of White trucks and Hobbs trailers.

With the above equipment, the plant started operation during August, 1942, without any difficulty. The first cement made was 206A and was shipped a few days after the initial operation to the United States Navy after its quality had been accepted by the Navy Inspector at the plant. Up to the present time, no cement has been rejected by either the Army or the Navy.

Add Kiln to Increase Production

Because of the large demand for cement in the Caribbean area, it was decided to increase the production of the plant to 2800 bbl. a day. To get this higher production, a new Smidth

Unax kiln was purchased. The new Smidth kiln, which is 9 ft. 2 in. by 8 ft. 2 in. by 9 ft. 2 in. outside diameter and 324 ft. long, is equipped with a ten-unit Unax cooler, 3 ft. 5 in. diameter by 18 ft. 4 in. long. The kiln will be equipped complete with auxiliary equipment, such as spiral scoop slurry feeder with synchronized drive; tightening device between kiln and dust chamber; induced draft equipment, consisting of a No. 36 FLS induced draft fan and Louvre damper; oil firing equipment and primary blower; and centralized kiln control equipment.

The grinding department will be expanded by the installation of an 8- x 36-ft. Smidth Unidan mill for clinker grinding. A Raymond air separator will be installed in connection with the mill. It is the intention to convert the existing 7 ft. 3 in. by 29 ft. clinker grinding Unidan mill to a slurry grinding Unidan mill when the new clinker grinding mill is installed.

Raw Materials

Local topography favors the quarry operation. A very high grade of limestone deposit is found in several hills some 600 ft. high and covering an area of around 150 acres adjacent to the factory.

A deposit of clay of good quality is also available adjacent to the factory. Also, on top of the limestone deposit, a very extensive deposit of silica sand of 99 percent purity was found and this is used along with the clay to make the special 206A cement. Iron ore is brought from a deposit located in the vicinity of the city of Ponce, about six miles from the plant.

PLANT EXPANSION

Oil and gypsum constitute the only material that has to be imported into the Island. One year's supply of gypsum was brought from Nova Scotia at the time the plant was started. Investigations are still being conducted to locate gypsum near the city of Ponce, and prospects are promising as small deposits already have been found.

Venezuelan oil is used for the firing of the kiln. The present daily oil consumption is 11,000 gal. and this will increase when the new kiln is put into operation sometime this coming June to 28,000 gal. per day, as production is stepped up to 2800 bbl. of cement per day.

The plant has storage tanks with a capacity of 1,100,000 bbl. at the plant's site, and also another storage tank with a capacity of one million gallons at the port of Ponce where oil is pumped directly from steamer tankers to storage. From this tank, oil is hauled by means of tank trailers to the plant site three miles away. In the future, a pipeline is contemplated to pump oil directly from our boat receiving tank to our storage tanks at the plant site.

Raw materials have the following analysis:

	Limestone	Clay	Sand	Iron Ore
SiO ₂	5.08	53.38	98.12	3.02
AlO ₂	1.35	17.99	1.32	3.00
Fe ₂ O ₃	1.58	7.73	0.10	95.05
CaO	50.14	2.94	0.14	0.74
MgO	0.62	3.71		

A raw slurry for producing "206" moderate heat cement can be obtained by proportioning the materials as follows:

85.0% limestone
8.6% sand
6.0% clay
0.4% iron ore

Standard portland cement as well as various special cements can be produced by combining the various raw materials in the proper proportion.

Ownership and Management

This new cement plant was built with capital invested by the Roig and Ferré families on a 50 percent basis, and with the help of a loan from the Reconstruction Finance Corporation.

The present management of the cement plant is vested in Luis A. Ferré, in charge of production as co-managing director and treasurer, with the assistance of Herman Ferré. Under them, C. H. Sonntag acts as the advisor with O. M. Girod as plant manager and C. L. Cintron as assistant plant manager and head of the laboratory. Sales, purchases, insurance, advertising, transportation and

other commercial activities are in charge of José A. Ferré as co-managing director and secretary, with the assistance of Carlos Ferré. Under them, Andres Lugo-Vina acts as business manager and Alejandro Torres is the company's auditor.

The Board of Directors is the same as originally elected and as mentioned before in this article.

Together with the production of the Puerto Rico government plant in San Juan, the total production of cement in Puerto Rico by June of this year, will be around 5000 bbl. per day, of which the Government plant will produce around 2200 bbl. and the Ponce Cement Corporation 2800 bbl.

This total production should take care of all the requirements of the Island of Puerto Rico and also of the area surrounding it, such as Santo Domingo, Haiti, Trinidad and other smaller Islands of the Caribbean. Already an important sale has been made to Santo Domingo from which country it is hoped to purchase the necessary gypsum as the island of Santo Domingo has extensive deposits of the very best quality gypsum.

The main office of the Ponce Cement Corporation is at Ponce, Puerto Rico. A temporary office to look after purchasing, shipping and priorities is located at 120 Wall Street, New York City.

Rotary Kilns for Chrome Ore Concentration

UTILIZATION of the low-grade domestic chromite ores of Montana and the Pacific Northwest has been a problem of interest to the U. S. Bureau of Mines for a number of years. "We have been definitely interested," stated Dr. Sayers, chief of the Bureau, "in developing our domestic resources of minerals to the fullest possible extent, and we have attacked this problem in two ways, (1) to develop a process for producing pure chromium metal by electrolytic methods; and (2) to produce by metallurgical operation a product which might be used for making standard ferrochromium. This work has been quite successful along both lines, but of greatest immediate importance at present is the process for producing a concentrate that is readily usable for making standard ferrochromium."

Removal of an excessive amount of iron from chromite ores is the chief metallurgical problem, according to R. S. Dean, chief of the metallurgical division, Bureau of Mines, whose experiments have shown that

this can best be accomplished by the reducing roast and leaching process. In this method, after the chromite ore concentrates are received from mining and concentration plants, they are mixed with coke and treated in a rotary kiln especially designed by Bureau of Mines metallurgists. The material thus treated is cooled, and part of the iron is removed by gravity concentration or by magnetic methods. Additional reduced iron may be removed by leaching with sulfuric acid, or sulphur dioxide leaving the residue enriched in chromium.

Reminiscences by Old Timer

"Yassir, son, times sure have changed. When your grandpop worked at the cement mill we didn't have any jim crack water basins to wash in. Old Ed—that was my pal—and I would heat a piece of iron, and say, that's one of the slickest ways to heat a pail of water y' ever saw. We'd dust ourselves off with a couple puffs out of the air hose and wash up in a jiffy. And say here's something you may never see again—it's an old fashioned bag rack. One is wood and later they made 'em of iron. Well, sir, I thought I was about the best cement packer in the business—so did Ed. We got so we could fill them bags with 2½ scoops of cement—right in the nose. You think you'd rather run one of them new packin' machines, eh? Well, it was this way, boy—when Ed and I got too old to pack, the boss couldn't find the likes of us so they just turned to machines and they been doin' it ever since—but they ain't as good as Ed and me."



Antique bag holders discovered by Wolverine Portland Cement Co.

RECOVERING FINES

Eliminating Phosphate Wastes

Hoover & Mason Phosphate Co. completes improvements in washing plant, increasing storage capacity and giving more uniform flow of material

IN THE TENNESSEE phosphate lands around Mount Pleasant, operators of recovery plants are continuing to direct more attention to processing of lower grade materials. Some are re-working previously discarded dumps in order to conserve their resources. Recovery of more fines is also desirable. The ability of these producers to meet market requirements for a specified B. P. L. (bone phosphate of lime), in processing low-grade muck, depends upon how efficiently their washing and recovery plants can perform.

In 1938, the Hoover & Mason Phosphate Co. had completed a new washing unit that is a good example of an efficient plant built to fit that production trend. It was constructed with large settling areas to recover much of the fines hitherto wasted and for a number of stages of scrubbing and washing, with the use of large volumes of water. The whole process, in raising the B. P. L. to acceptable standards, is one of alternate rubbing and washing. A complete description of that plant was published in *Rock Products*, August, 1938, pp. 34-38.

Recently the plant was visited again and this article is intended to point out refinements that have become desirable to a washing plant built new just four years ago. Flow-sheets of the washing plant as it was built and now is operated are reproduced for the purpose of comparison.

Deposit Characteristics

Phosphate rock in the area occurs as a partially disintegrated phosphatic limestone underlaid with limestone. Very little of it is available as plate rock and the bulk comprises phosphate sands in a matrix heavy in loam, clay balls and other materials which must be removed. Most of the sands run from 300-mesh to 1/2-in. That's why alternate cycles of scrubbing and washing are needed. Highest grade phosphate must have 72 percent B.P.L., and the lower

By BROR NORDBERG

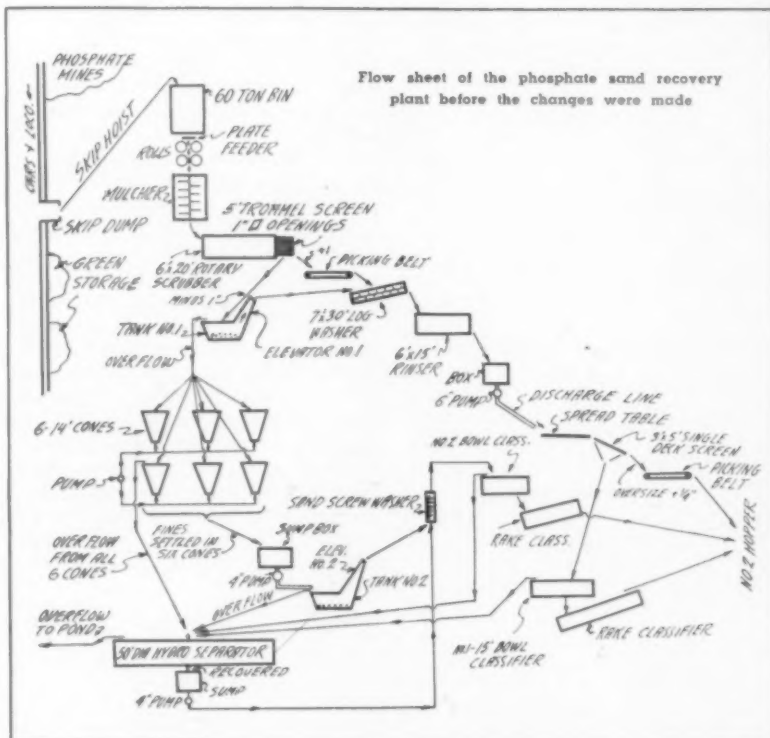
grades must test 65 to 68 percent after processing.

Three open pit mines are still being exploited, but less promising areas are being worked, when market requirements permit. Characteristics of the matrix fluctuate, so that there are decided day-to-day differences in the muck delivered to the plant.

One P. & H. and two Monighan type draglines, with 1 1/4- 2 1/2- and 1 1/2-cu. yd. dippers, do the stripping and excavate the phosphate, which is loaded into 4-cu. yd. Western side-dump tram cars. Trains are hauled over 3-ft. gauge track to the plant by 18-ton Davenport locomotives from as far distant as two miles.

The biggest change made to the plant is where the muck enters into the washing plant. An entirely new storage system was built and a new system of reclaiming stored materials for plant delivery was adopted. Bigger reserve tonnages were found to be desirable, since the demands for phosphate began running well above normal for agricultural application and for the manufacture of elemental phosphorus. Now the washing plant can run three full shifts, with one- or two-shift operation in the mines.

It used to be that the tram cars would dump into a 4-ton skip hoist bucket for direct delivery to the washing plant, or they would dump into three reserve storage dumps alongside the track. One pit contained high-grade, another was for

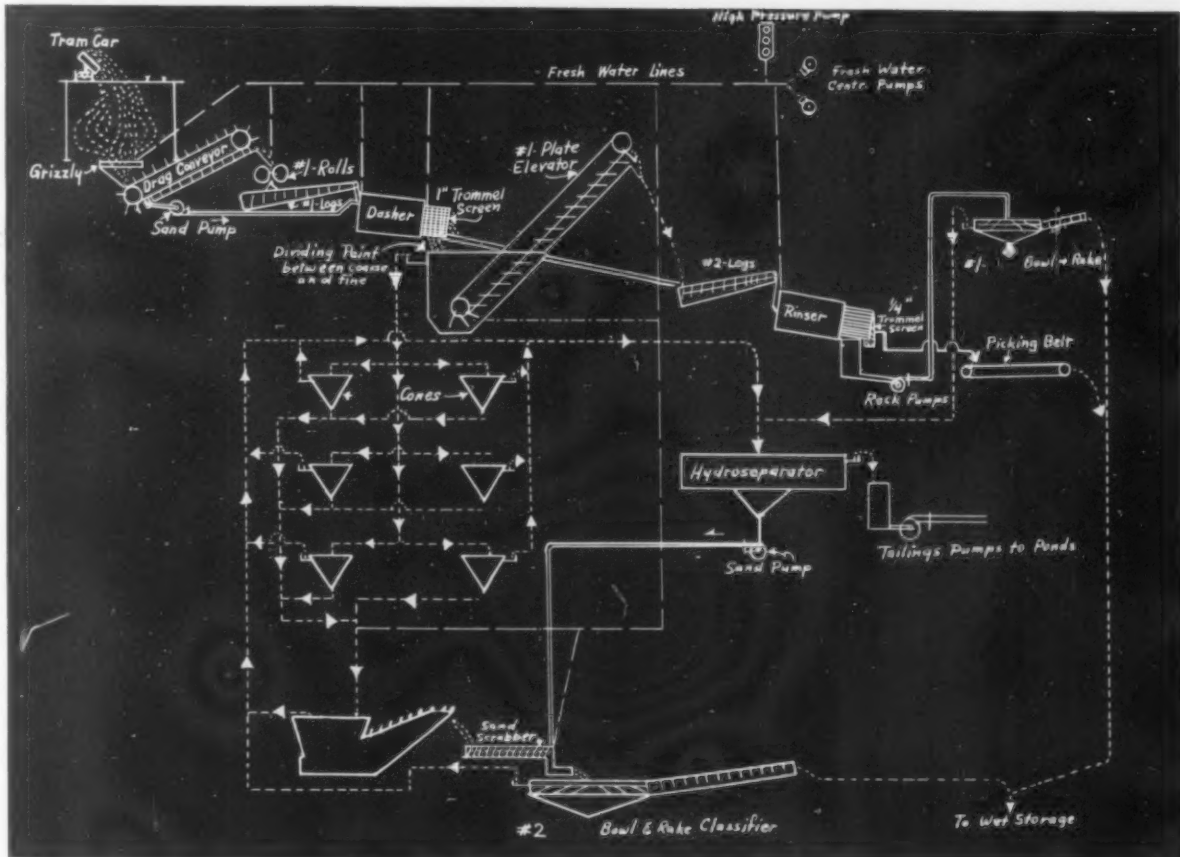


RECOVERING FINES



General view of plant. On the left is the new railroad trestle and muck storage system showing continuous drag conveyor to feed plant. In the foreground is the hydroseparator and to the extreme right is the stiff leg derrick to handle phosphate sands in wet storage and into hopper from which plant driers are fed

New flow sheet of phosphate sand recovery plant showing improved method of handling from storage and the use of an elevator-classifier to obtain more uniform flow of material



RECOVERING FINES



New trestle, 425 ft. long, under which 9000 tons of raw material is stored for processing

low-grade and the third sub-grade green material.

The trouble with this system of storage was that there was some re-handling by locomotive crane. Muck, which could not be fed directly to the washer, had to be dumped and handled into storage by the crane and, when reclaiming it, cars had to be re-loaded and moved back to the skip bucket pit to dump again.

A system for storing green phosphate underneath an overhead railroad trestle and for reclaiming it continuously was constructed, so that cars can dump directly into it. The longitudinal axis of the storage area, which is 425 ft. long, is perpendicular to a cross conveyor at its mid-point, which delivers to the plant. Reclaimable storage capacity is 9000 tons in an area 28 to 30 ft. wide with 21 ft. overhead clearance to the bottom of the railroad stringers. Practice is to store high-grade at one end and low-grade at the other, either reclaimable to a hopper at the center.

The railroad trestle is supported on I-beam columns, with heavy I-beam cross members and stringers.

A glance at the original flow sheet shows that muck was elevated by the skip hoist into a 60-ton overhead

steel bin. A plate feeder under it fed the muck consecutively through two pairs of smooth-faced rolls to break down lumps. The next step in the flowsheet was passage by gravity through a revolving bottom plate mulcher where the muck was shredded and much of the clayey material emulsified as a preliminary treatment. Then followed passage through a cylindrical scrubber with a trommel end screen where a separation was made at 1 in. Fines were treated through a series of classifiers and settling basins while the plus 1-in. material was picked over a belt and put through a twin log washer, etc.

Changes in Flow Sheet

All of this has been changed. The spasmodic feed to the plant by intermittent skip buckets dumping, and the slugs of material, or starvation, through the mulcher were not conducive to good overall plant efficiency. The mulcher location, with respect to the bin overhead and the two pairs of rolls, made normal maintenance difficult. A better arrangement had to be made.

An operator on a rail-mounted carriage carrying a 50-hp. cable-

hoist, electric motor powered, reclaims muck in storage from the ends into the central hopper by a 1-cu. yd. bottomless Holcomb bucket. The hoist is Sullivan equipment. Any plate rock or limestone are taken out over a grizzly, with 16-in. spacings, that covers the hopper. Water from a high pressure jet is played over the muck at the grizzly to break up lumps and help force it through.

In place of the overhead 60-ton surge bin, the plate feeder underneath it, the two pairs of rolls and the vertical shaft mulcher, there is now a single pair of rolls over a log washer. Muck is passed through the rolls continuously from the storage hopper by the newly-installed inclined drag bucket conveyor. It turns on 92-ft. 6-in. centers, with an incline of 29 deg., and has buckets 10-in. deep by 35-in. wide spaced 36-in. apart.

Originally, all the muck, after emulsification, was put through a cylindrical scrubber with attached trommel screen. Everything plus 1 in. passed over a short picking belt conveyor into a 7-ft. by 30-ft. Mc-Lanahan and Stone twin log washer together with some intermediate size (80-mesh to 1-in.). That log washer



Left: "Dasher" or scrubber screen which is fed from the first log washer in flow sheet. Separation is made at 1-in. on circular screen. Oversize is put through another log washer. Minus 1-in. drops into tank for elevation by plate elevator. Right: Plate elevator designed by the company for handling phosphate under 1-in. containing fines. Perforated plates assume horizontal position when bringing phosphate up from the water in the tank

RECOVERING FINES

is retained in the flowsheet just as it was before, without the preceding picking belt, and the second log washer ahead of it is of the same size. The cylindrical washer which receives all the muck coming from No. 1 log washer is 5- x 20-ft. with straight lifting flights. A separation is still made through 1-in. square screen openings, and all plus 1-in. is fed into No. 2 log washer.

Method of Handling Fines

Hoover and Mason engineers saw fit to make a change in the handling of minus 1-in. material passed through the cylindrical screen. Originally they developed and installed a combination settling tank and bucket elevator to receive all minus 1-in. Hydraulic water was introduced into the bottom of the tank to regulate the settling rate of the fines for a separation at about 80-mesh. About 10,000 cu. ft. of water per hour, almost half of the total used in the washing plant, was introduced into this tank through a controllable hand valve. Material in the range 80-mesh to 1-in. was elevated to join the plus 1-in. in the log washer.

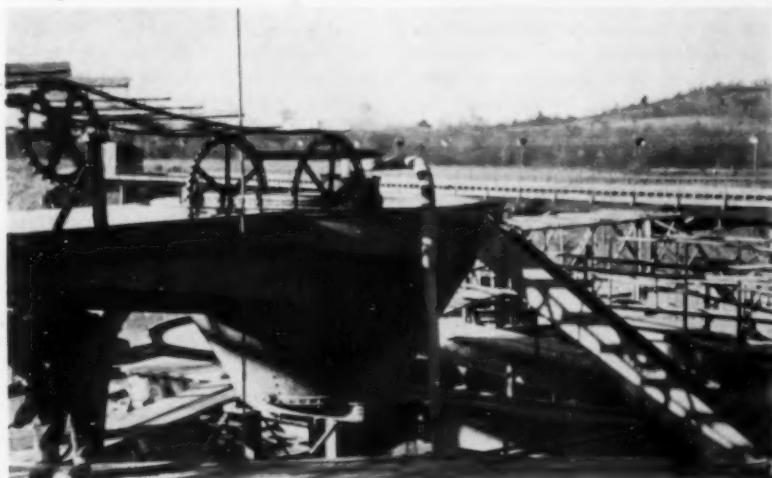
This combination elevator-classifier has been replaced by a "plate" elevator also designed by company engineers, that does the same work, but more effectively and with much less maintenance. Instead of buckets there are a series of plates, hinged by links, which enter the settling basin downward as one continuous plate. Emerging from the water, the plates come up as separate horizontal decks carrying material that had settled. There are 44 pans, or plates, of $\frac{1}{4}$ -in. steel, with $\frac{1}{8}$ -in. punched holes for dewatering the sands as they are carried up a vertical height of 28 ft.

All plus 80-mesh material is scrubbed through No. 2 log washer and then put through a cylindrical scrubber, or rinser, with attached trommel screen that has $\frac{1}{4}$ -in. square openings. Plus $\frac{1}{4}$ -in. is conveyed over a picking belt into wet storage as finished product. Minus $\frac{1}{4}$ -in. is pumped by a 6-in. centrifugal pump into a 15-ft. Dorr No. 1 bowl and rake classifier in a very dilute solution. The classifier makes a separation at about 100-mesh and the recovered product is discharged into the storage pit. About 40 percent of the washing plant output is the product of this classifier. Minus 100-mesh overflowing the classifier

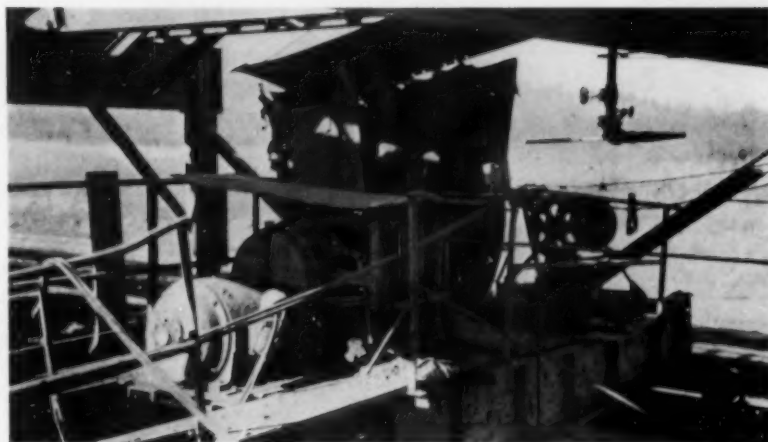
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Material is drawn from storage below railroad trestle by 1-cu. yd. scraper bucket which brings "muck" to hopper from which plant is fed



Sand drag which is fed the product from the settling cones. Overflow goes to the hydro-separator and the sands are scrubbed and sent to bowl-rake classifier



Motor-driven hoist which operates scraper bucket handling "muck" in storage under trestle

Produce 180 Tons Road Mix Per Hour

Porter W. Yett, Portland, Oregon, uses quarry methods in excavating sand and gravel for bituminous mix, and ready mixed concrete plants

By RALPH S. TORGERSON

EVERY TWO MINUTES a 6-ton truckload of bituminous mix is filled at the plant of Porter W. Yett, Portland, Ore., destined for pavement construction at shipyards and other war construction projects. That this schedule is pretty closely held is indicated by the plant production rate of 180 tons an hour which does not allow for much delay between loads.

When it was decided to let the contract, the sand and gravel production facilities of Mr. Yett's plant were found to be more than adequate for the job and no other plants in this area were in a position to produce materials in the time required.

The method of excavation, closely approximating quarry operation, lent itself admirably to a high rate of production. Practically the entire deposit has been opened up in a long high face, semi-circular in shape,

with benches serving as roadways. This permits an accurate estimate of the types of material in the deposit and makes it easy to step up production very rapidly when demand requires it. The pit itself serves as a stockpile area.

Excavation from the pit is by means of two Koehring shovels operating at whatever bench level or section of the pit that is desirable at the time. Material is loaded into trucks with these shovels and transported to the washing plant. Two 3½-in., 20-hp. high speed Fairbanks, Morse centrifugal pumps deliver approximately 750 gal. of water per minute to this plant. After taking out the small commercial size concrete gravel,

the oversize is then passed through the Traylor crushers, using the dry screening method. Material is then stockpiled or delivered to the bituminous mix plant.

Two Crushing Plants

Aggregates for the bituminous mix comprise a minus ¾-in. sand and a crushed 1¼-in. gravel for a base material and a crushed ¾-in. gravel for a wear course. Two crushing plants for this purpose are available. The original plant for concrete aggregates has a 2-ft. 4-in. TY crusher, and a new plant was built at the time the big bituminous contract was obtained which comprises a 1-ft. 8-in. Traylor two-stage crusher that has a production of 20 to 25 cu. yd. an hour, depending on the size of the stone being crushed.

The two-stage crusher is shown in the illustration with Mr. Yett watching it in action. Note the screen wire hopper above crusher opening to prevent spillage and provide a maximum feed. A short Chain Belt conveyor carries the crusher product to a bunker, below, for truck loading.

Sand or gravel is loaded into trucks by means of a 1-cu. yd. Trackson-Caterpillar loader operating from stockpiles at one of the pit levels or benches. Stockpile capacity is about 15,000 cu. yd.

At one end of the pit nearest the steam railroad tracks, timber bunkers have been built into the side of the pit so that trucks dump their loads of sand and gravel into compartments at the upper ground level. This arrangement provides for gravity flow of materials to the Madsen hot mix plant at the bottom of the pit.

Below the aggregate bunker compartments is a 30-in. Rex belt conveyor, about 60-ft. centers, which reclaims the sand and gravel to a hopper feeding the oil-fired rotary dryer. A unique type of gate feeder



Looking down at "hot mix" plant in excavated part of gravel pit. Bunkers for sand and gravel are built into the bank, to the left, and oil storage tanks may be seen in the upper right background



Sand and gravel deposit of Porter W. Yett, Portland, Ore., which is excavated in benches with long, high faces like quarry operation. This permits selection of materials to fit demands

was developed by Mr. Yett for controlling the flow of aggregates from the bin compartments.

Dried materials go to an enclosed bucket elevator to the top of the plant where a 4000-lb. pug type mixer

mixes the hot asphalt and aggregates which are automatically weighed out in a batch hopper ready to be dumped into the truck below. Although the rated capacity of the Madsen hot mix plant is 150 tons an hour, this

plant has run as high as 180 tons an hour, dependent on moisture of aggregates.

Tracks above the plant have sufficient capacity for six 40-ton cars of asphalt. A pipe runs from the cars



Convenient method of loading truck from pit stockpile to supply bunkers feeding hot mix plant



Crushing gravel for bituminous mix plant. This is a two-stage crusher with a short conveyor to truck loading bunker



Close-up of two-stage crusher with screen wire hopper for maximum feed. Porter Yett watching operation



Flat belt electric motor drive at right angles to two-stage crusher is protected by shed and cover over motor



Truck roadway over bunkers for sand and gravel fed to hot mix plant. Heavy timbers set on end form grizzlies through which aggregates flow to compartments



Bunkers built into side of pit. Covered belt conveyor reclaims sand and gravel from bin compartments to hot mix plant dryers, shown to the right

to two storage tanks, each holding a carload. This is a 4-in. pipe with a one-inch steam pipe inside to speed up the flow. A flexible coupling in the inside steam pipe allows it to be inserted into the tank cars.

There is a booster steam pump alongside the tracks which may be connected to the asphalt pipe lines to raise the asphalt into the paving plant storage tanks which normally are fed by gravity. This steam pump is used to increase the flow when the gravity feed slows down to a point where it fails to supply the needs of the mixing plant. The storage tanks

also have steam heating coils. Asphalt from the two storage tanks flows by gravity to a tank alongside the hot mix plant. Known as the hot-well tank, it has a capacity of one carload. This tank also is heated by steam coils. A 2½-in. asphalt pump elevates the hot asphalt up to the weighing scale on the mixing box.

At the top of the hill, there is also a 1000-gal. water tank to supply the syphon tank for the 85-hp. boiler supplying the steam for the coils.

Porter W. Yett is owner of the company. Associated with him in the enterprise is Theodore Arenz, past

president of the Portland chapter, American General Contractors; Frank M. Patterson, and Porter W. Yett, Jr.

Mica Committee

MEMBERS of the W.P.B. Industry Advisory Committee on scrap mica are: Charles Bradley, Bradley Mica Co., Inc., Franklin, N. C.; J. Fuller Brown, Lincoln Mining Co., c/o Asheville Mica Co., Biltmore, N. C.; Milton Burleson, Vance-Burleson Mica Co., Spruce Pine, N. C.; James Edwards, Carolina Mica Co., Kingsport, Tenn.



Close-up of hot mix plant, showing truck about to receive a load



Oil-fired dryer with "hot well" asphalt tank to the right. Bucket elevator takes heated aggregates to top of mixing plant

For Victory Gardens

WE PROMISED in the April issue to review some of the literature being used by lime and limestone producers to increase the use of lime for home gardens. Unfortunately this literature appears to be all too scanty in spite of the fact that there never was such an opportunity to popularize a prosaic commodity. In view of the fact that the U. S. Department of Agriculture has done nothing, it is all the more necessary that the producers themselves exert all the power of publicity of which they are capable.

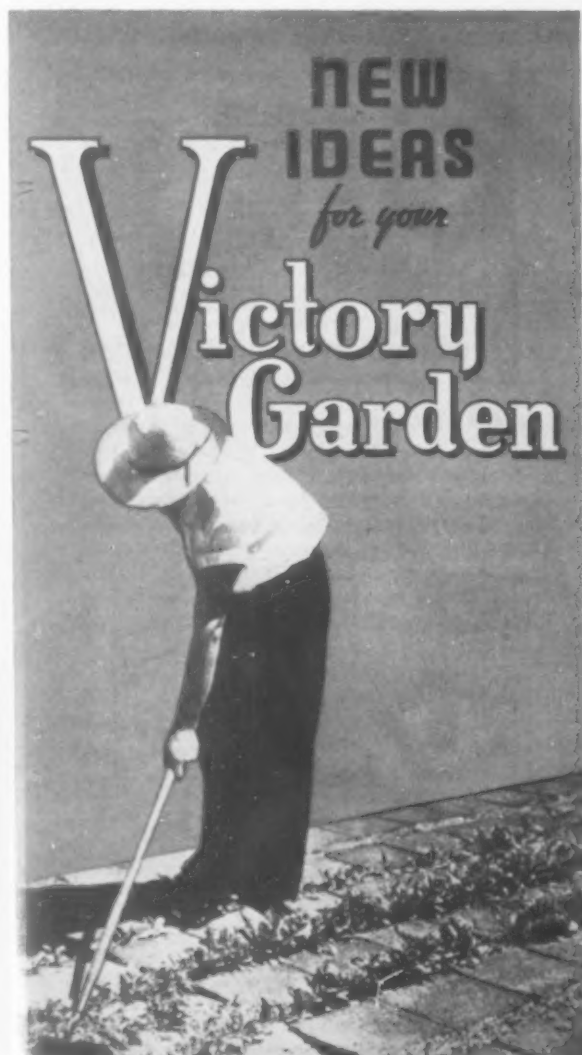
To introduce the subject, let us

What Producers Are Using as Promotional Literature

quote a few paragraphs from a very interesting article in the February 25, 1943, issue of *Chemical and Engineering News*, entitled: "Soil Fertility and the Human Species," by Wm. A. Albrecht, University of Missouri. This article, or more specifically this extract, could well serve as the basis of any promotional literature, since it provides in simple language an understanding of the whole problem of soil fertility, or the

lack of it. The quotation is as follows:

"The soil fertility of an individual farm can be depleted enough through failure to return manure, crop residues, and other fertilizer forms in a single human generation, to shift that farm from a place of good health to one of deficiency diseases for the farm animals and for the families on it. The same crops still growing after 50 years of farming, may have shifted from protein-producing, mineral-supplying, health-giving sustenance to vegetation mainly of fuel value, with nutrient



OTHER CONCRETE IMPROVEMENTS

for the "Victory Gardener"

☆☆☆

SMALL GREENHOUSES—To give your seeds a quick start . . . protect young plants from frost.

HOTBEDS and COLD FRAMES—For flowers or vegetables to assure maximum plant production from seed used.

MANURE PITS—To prevent leaching of valuable fertilizing elements from stored manure.

COMPOST PITS—For the home-owner's convenience in converting grass, leaves, etc. into garden humus.

Ask for information on above improvements



For the BEST THERE IS in CONCRETE

Left: Front cover of booklet for victory gardeners, giving useful information concerning lime and other helpful hints. Right: Back cover of booklet

LIME AND FOOD



The Plant Pantry, a suitcase full of packaged fertilizers, easy to handle, no unpleasant odors! Bone meal, cow manure, hyper humus, hydrated lime, peat moss, plant food, powdered lime and sheep manure. All for \$1

Advertisement of one of the department stores in Chicago

deficiencies. The shifts may occur without changes in tonnage output. Here is a national weakness that is being heralded by a loud voice—but apparently unheard—in the rejection figures, for example, of Army draftees.

"We as higher animals, along with the lower ones, are experimenting increasing nutrient deficiencies because the declining soil fertility is giving us food that is mainly of fuel value. This shift to foods mainly of fuel value is aggravated still further by processing methods in which the starches and sweets are retained and the minerals discarded. The shift is undermining reproduction and other delicate body functions. We are about to appreciate the fact that our soil fertility is the place where we undergird rather than continue to undermine the national health.

"Viewed in simple geochemical

fashion, soils are ephemeral. They are rocks in various stages of progress in going from mountain to sea, or from solid to solution. Silicic acid is passing out as it bows reverently to the quiet, but persistent, onslaughts by the simple and weak carbonic acid. Soils are the many intermediate products during this change from the silicates of the basic elements to their nitrates, phosphates, sulfates, extensive carbonates, and other simple products.

"Reduced to a simple scheme, the processes of soil formation and development, or this march by rock to the sea, may be divided into two stages. The first is mainly constructive in which clay and organic matter increase in the soil. There is also an increasing capacity and content of nutrients of service in plant and animal life. This occurs because colloidal absorption and colloidal ex-

Below: Inside of booklet illustrated on preceding page



KEEP WEEDS OUT OF YOUR VICTORY GARDEN . . . INCREASE CROP GROWTH with a MULCH of concrete slabs

Rows of inexpensive concrete slabs throughout your Victory garden will provide the answer to many problems facing the spare-time gardener, according to tests made by the United States Department of Agriculture. The concrete slabs serve as a mulch which controls weeds, conserves moisture, and keeps the earth warm by absorbing the sun's heat. In addition, plants grow faster . . . less watering is necessary . . . work of cultivation is reduced . . . the blocks provide convenient mud-free garden paths. Try mulching a part of your garden this year with concrete slabs . . . compare the difference in growth and saving in labor! When the need for a Victory garden is past, the blocks can be used for flagstone walks, terraces, or curbs for flower gardens.

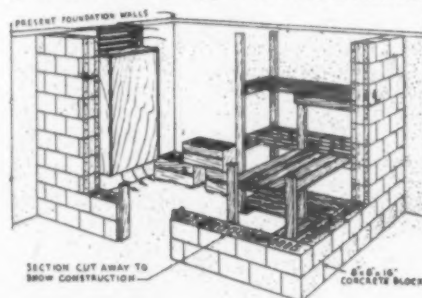
Mulching Blocks are Easy to Make

One sack of Ash Grove Portland Cement will make approximately 32 concrete blocks or slabs 9 inches wide.

12 inches long, and 2 inches thick. The recommended concrete mixture is 1 part cement, 2 parts sand, and 4 parts pebbles (1:5 mix if sand-gravel aggregate is used). As porous blocks are best, mix with a minimum amount of water. The concrete should then be tamped into forms which can be made out of any 2-inch lumber. Cure for several days at 70° F. When hardened, paint top surface with inexpensive block paint, to increase heat absorption.

SAVE THE FOOD YOU GROW FOR Winter CONSUMPTION!

BASEMENT STORAGE—A corner of your basement can be made into an ideal food-storage place. Properly ventilated and insulated, a room as illustrated will enable you to keep garden vegetables all winter long. Plans are simple, and readily adjusted to any basement location. Ask us for a copy of Ash Grove Plan No. 39.



STORAGE CELLAR—More than ever, an adequate, underground storage for fruit and vegetables is a "must have" improvement for every farm and suburban home. Concrete is the preferred material for storage cellars. We have plans available for several types of cellars—come in and discuss your requirements with us.

LIME AND FOOD

change of plant nutrients come into more prominence as the soil's content in clay and humus increases. These two, the humus and more particularly the clay with silica in dominance, are the constituents that carry increasingly large stores of soil fertility. These stores include calcium, magnesium, potassium, and other elements in absorbed forms, not leached readily by water, yet exchangeable to plant roots. *These are the soils in which calcium dominates over all other nutrients.*

"The second stage of soil development is destructive. Increasing climatic forces, in forms of heavier rainfall and higher temperatures, give the soils a higher clay content. This clay gives up its adsorbed calcium very rapidly, while its magnesium and other bases are less rapidly exchanged for hydrogen, through leaching and removal by plant

growth, to become an acid soil. Under still higher temperatures and more rainfall, the clay itself increases in quantity but is also changed in chemical nature through reduced dominance by silica. As a consequence, such clay no longer retains plant nutrients or bases readily in adsorbed forms. It no longer holds hydrogen to make the soil significantly acid. It is then neither acid nor loaded with elements of soil fertility, but is chemically inert. This inclination of the more highly leached clay toward neutrality—or what is more properly a chemical indifference because the clay does not hold even hydrogen—has been interpreted by many to mean that the soil has no need for calcium. Quite the contrary, such soils are decidedly deficient in this element."

Below: Front and back cover of booklet advertising use of lime

Basis of Soil Liming

If the reader is able to absorb the meaning of the foregoing paragraphs, he has a fairly definite understanding of why nearly all old soils require lime in one form or another. In the case of back lots and other pieces of ground now being devoted to Victory gardens, the need is all the more urgent because such ground probably never has been limed or had any other kind of fertilizer. The rainfall in and around cities and industrial plants, moreover, is decidedly acid, and the drainage rapid, so that the soil in such lots has probably been leached of every vestige of plant nutrients. Sure, plants will grow there, but of what value are they as food for human beings!

Of these most important facts, the Department of Agriculture's "Victory Gardens" booklet says nary a word. One would gather from reading it

OTHER USES

Banner Lime is excellent for spraying and dusting. Amount required will vary as to formula being followed. Full instructions can be obtained by writing us.

For use on established lawns, use 5 to 10 lbs. to the 100 square feet, dusting evenly over the surface.

For new lawns prepare the soil and apply Banner Lime the same as preparing the soil for your garden.

Use it (dry) in your furnace to prevent rust and corrosion while idle, dusting the grate bars and other cast iron parts.

Makes Excellent Whitewash . . . Mix 5 lbs. Banner Lime with 2 gallons water. Sift lime into water and stir to creamy consistency. *Note:* A little bluing added helps bring out whiteness; 2 ounces powdered alum prevents rubbing off; $\frac{1}{2}$ pound common table salt or $\frac{1}{2}$ pound portland cement helps make weatherproof.

CHEMICAL ANALYSIS

CaO — 48.0%	MgO — 33.62%
Percentage passing 20 mesh.....	100%
60 mesh.....	99.3%
100 mesh.....	98.9%
Neutralizing Power in terms of Calcium Carbonate.....	169.07%



for your
VICTORY GARDEN

BUY U. S. WAR BONDS AND STAMPS

LIME AND FOOD

that vegetables contained the necessary minerals whether these are present in the soil or not. Probably one season's crop will not seriously affect the nutrition and health of the family, but if home gardening becomes a habit, it is obvious the home gardener is greatly in need of information on what the use of lime will do to prevent mineral deficiency diseases.

Samples of Advertising

The only example we have been able to discover of advertising lime for the home gardener is in one corner of a newspaper page of a Marshall Field & Co., Chicago department store advertisement, reproduced herewith. Here lime is featured as one of several packaged fertilizers in a "Plant Pantry."

Only two lime manufacturers that we have been able to discover have

attempted to tie up "victory gardens" specifically with lime. These two are the National Mortar and Supply Co., Gibsonburg, Ohio, and the Ash Grove Lime and Portland Cement Co., whose home office is in Kansas City, Mo. These are tiny leaflets, about 3¼ x 6 in., but both manufacturers say they are producing results. These leaflets are reproduced herewith, without color, which in both instances are red, white and blue. The Ash Grove Lime and Portland Cement Co. has another small leaflet, "Suggestions for Using Lime Around the Farm and Home," which has also proved helpful. It covers briefly such topics as: "Make compost for your garden"; "Retard ammonification of manure"; "Economical household sanitation," etc.

Below: Inside of booklet promoting use of lime for victory gardens

Nearly all the lime manufacturers who package lime in 5- and 10-lb. packages issue leaflet instructions with the packages, and of course the use of lime on vegetable gardens receives some attention, but obviously these were not especially prepared for the home gardener, and contain too much extraneous material to focus his attention on the most vital needs of his vegetables. Most of these manufacturers are using the same literature they distribute to farmers, who have at least some knowledge as to the use of lime. Our own personal experience with neighbors is that they never have heard of using lime on their gardens, and are inclined to be very skeptical about using a material they have never seen used except for mortar or plaster.

In some cases we have heard of county agricultural agents, and others

(Continued on page 60)

Banner Lime THE FARMERS' CHOICE IS READY NOW FOR YOUR VICTORY GARDEN



**BE SAFE AND START YOUR
GARDEN WITH BANNER LIME
EVERY GARDEN NEEDS IT!**



Agriculture has been called upon to play the most important role the world has ever known. This little folder is dedicated to thousands of "back-yard gardeners" who, in many cases, will be breaking ground for the first time this Spring.

Practically all soils need Lime to correct natural acidity which results from rain water leaching essential elements from the soil or from plants (cultivated or not) that take elements out of the soil.

You can have your County Agricultural Agent test your soil and tell you about its lime requirements. However, it is a safe rule to start your garden with lime.

Banner Lime is a "conditioner" of soil. It neutralizes acidity, helps to hold moisture, and will tend to break up stubborn lumps or clods.

Banner Lime contains both Magnesium and Calcium so essential to plant growth. . . . By

conditioning the soil with Banner Lime, you can cut down on your fertilizer bill as it makes available to the growing plant the essential food elements of nitrogen and potassium, naturally present in the soil. By using Banner Lime as directed, the growing plants have available for their use four elements: calcium, magnesium, nitrogen, and potassium.

A 25 lb. bag of Banner Lime will cover an area of 500 square feet equivalent to a garden plot of 20x25 feet. The amount to use on smaller or larger plots can be figured by using 25 pounds for every 500 square feet.

Banner Lime is 99% plus pure. It is non-caustic, and will not burn. When used as directed, it will quickly react in the soil and give best results. If other information is required, feel free to call or write us.

We take this opportunity to wish you Happy Gardening.

NATIONAL MORTAR AND SUPPLY COMPANY

Offices: —1520 Grant Building, Pittsburgh, Pa.

Plants: —Gibsonburg, Ohio

Ohio Producers Promote Use of Agstone

Processed Limestone Association, Inc., sponsors research work in colleges, advances quality standards, and exhibits at State Fairs

CRUSHED STONE AND LIME producers in Ohio very early recognized the necessity of promoting the use of agricultural liming materials, and formed an association in 1915 for this purpose which was known as The National Agricultural Lime and Limestone Association. Garfield Wilder was the first secretary.

During the year 1917, the U. S. Department of Agriculture with the aid of the Agronomy Department of Ohio State University and the National Lime and Limestone Association enacted the Ohio Agricultural Lime and Limestone Law to authorize the licensing and the inspection of agricultural lime and limestone. In the following years machinery was installed at the various Ohio quarries to grind screenings. C. R. Wagner was employed by the association as a field lecturer, and \$5000 was contributed by the Association members in advertising agricultural limestone products in farm papers. Booklets were mailed direct to farmers showing results of liming material, largely determined by the research work of Dr. Thorne, Alfred Vivian, Dr. Firman E. Bear and C. G. Williams of Ohio State University.



A. K. Hausman, vice-president

Later on A. P. Sandles became secretary, and some excellent promotional work was done among farmers during his administration. A booklet entitled "Dollars and Sense," edited by Mr. Sandles was distributed in Ohio, neighboring states and in



Frank M. Coombs, secretary

foreign countries. It was Mr. Sandles who coined the word "agstone." The Association then changed its name to The National Agstone Association.

In the year 1921, the Soils Department of Ohio State University published the first tonnage report, showing that 97,951 tons of liming material was used in Ohio. Succeeding years showed very substantial increases in tonnage.

Harry Brandon, representing The Ohio Marble Co., arranged with Dr. Firman E. Bear of the university for a fellowship to study relation of the size of limestone particles to their rate of correcting soil acidity. L. B. Broughton started this fellowship work in 1923; Herbert F. Krige worked in 1924 and 1925, and Lilburn Allen completed the work in 1926.

Succeeding years showed a marked



Ralph M. Seifried, president of the Association

increase in the use of limestone. The report for the year 1929 showed that 237,381 tons of agricultural limestone were used by farmers in Ohio. During the depression years, when there was a decline in the use of liming materials, the Association carried on without benefit of a paid secretary. Frank Coombs and Phil Heim, however, gave much time and effort in keeping the Association intact. Men at Ohio State University and the Agricultural college, including Prof. Robert Salter, Earl Jones, John Slipper, D. R. Dodd, Everett Reed, G. W. Conrey, Earl Barnes, George McClure and F. J. Salter, published their findings in pamphlets showing the value of liming. The *Ohio Farmer*, *The Pennsylvania Farmer*, *Farm and Dairy*, *Copper's Farmer*, *Country Gentleman* and numerous



Philip E. Heim, treasurer



Attractive exhibit of the Processed Limestone Association at the 1941 Ohio State Fair

other farm papers carried the story of profitable liming. The Association redoubled its efforts in sales and promotion, in Fair Exhibits and in contact work with the Department of Agronomy and the Division of Plant Industry.

In 1936, the Association again felt the need of a paid secretary and engaged Lew Johnson of Toledo, Ohio, and the name of the organization was changed to The Processed Limestone Association. Sales of agricultural limestone jumped in that year to 318,959 tons, almost doubling the previous year's figure. The year 1940 was a banner year with 813,875 tons reported. Considerable impetus was given to production by the inauguration of the federal Grant-of-Aid program which started that year. In Ohio during this year, 225,000 tons moved on the Grant-of-Aid program and over 600,000 tons were sold direct to the farmers by the producers.

The year of 1941 saw the antiquated Ohio Lime and Limestone Law of 1917 amended. Under the amended law, it is mandatory for manufacturers to license their liming materials and to furnish customers with a complete analysis of their products, and it established a standard as to screen tests.

In 1941, statistics show that 1,145,429 tons of agricultural limestone were used in the State of Ohio, and in 1942 it has been estimated about 1,350,000 tons were applied by farmers of the State.

Producers in Ohio have not been entirely satisfied with the grade of

material adopted by the Government in the Grant-of-Aid program and the method of bidding. Committees of the Processed Limestone Association, meeting with Government officials, have been successful in having a better grade of material adopted but it was not possible to secure a higher neutralizing power than 80. Steps also have been taken to improve the methods of purchasing so that established producers will not be penalized in competition with producers who quarry materials from creek beds or stone of questionable analysis and grading.

As pointed out by W. H. Margraf, manager of the Agricultural Limestone Department, The Marble Cliff Quarries Co., in a paper before the Association, "The established producers offer year around service, but in many instances, not being low bidder, have huge stocks on hand available for the market but have not been permitted to fill orders in various counties, unless the low bidder failed to qualify during the shipping season—then the County Chairmen called a producer for shipments and if time permitted the counties' tonnage requirement was shipped. This practice interfered with the planning schedule of the farmers, reduced the effectiveness of the liming program and caused higher costs in the industry by unbalancing the operating program."

Officers of the Association are: President, Ralph M. Seifried, manager, Agricultural Department, National Lime & Stone Co., Findlay,

Ohio; vice-president, A. K. Hausman, manager, agricultural sales, Kelley Island Lime & Transport Co., Cleveland, Ohio; treasurer, Philip E. Heim, sales manager, agricultural limestone department, The Carbon Limestone Co., Youngstown, Ohio; and secretary, Frank M. Coombs, assistant sales manager, Ohio Hydrate & Supply Co., Woodville, Ohio.

Victory Gardens

(Continued from page 58)

who have attempted to instruct home gardeners, who have mentioned the use of agricultural lime for acid soils; and in some suburbs around Chicago high school chemistry teachers are offering to analyze the garden soil for acidity. The fact is, of course, that some lime is a safe bet on any home garden soil, except for white and sweet potatoes, and egg plants, none of which the home gardener goes in for to any extent. It is not likely that he will use too much lime; and he can apply it anytime during the growing season.

Producers Should Get Busy

It looks to us as if the lime and pulverized limestone industry is "missing the bus." If ever a little intelligent promotional work and popular advertising would do a real job for an industry it is right now.

Vermiculite Insulation

EXPANDED vermiculite has come into extensive use in recent years as an insulation material and a lightweight aggregate for concrete. Universal Zonolite Insulation Co., Chicago, Ill., recently issued a booklet of 86 pages describing the many uses of this interesting product with illustrations to show construction details where it is employed as lightweight aggregate in concrete. Specifications for Zonolite insulating concrete, as it is called, are given in detail.

The use of this aggregate in concrete block, roof slabs, reinforced trusses, etc., are described and illustrated. Engineering data on the strength of concrete units made with this aggregate is given in tables showing properties of chords and bars, both flat and round, with formulae for designing structural units.

Change Name

CHAZY LIME & STONE CO., INC., is the new name of the Chazy Marble Lime Co., Inc., Chazy, N. Y. Marshall Prosser is manager, succeeding D. K. Evans.

Eliminating Phosphate Wastes

(Continued from page 51)

(1½ percent solids) is laundered to a 50-ft. Dorr hydro-separator for further classification and recovery. That part of the operation is essentially as it was four years ago. The only difference is that a scrubber with trommel screen attached has displaced a separate rinser and 3-x 5-ft. vibrating screen and simplified the process that much.

This completes the flowsheet for the coarse and intermediate sizes. Fines overflowing the tank of the plate elevator, containing about 15 percent solids in the 80-mesh to 300-mesh size range, is split through guide plates and laundered into six 14-ft. diameter Allen cones. They are of the continuous discharge type with hydraulic rising water introduced from below. The volume is regulated by hand valves. About 10,000 cu. ft. per hour of water is introduced in this way.

The cones settle out a product from 60-mesh to 200-mesh with most of it approaching 60-mesh size. As originally laid out, the fines joined in a common box below and a 4-in. pump transferred them into No. 2 tank and pan elevator, a unit which was the same as the No. 1 now displaced by the plate elevator. Instead the fines are now pumped into a sand drag and then are scrubbed through a sand screw washer to become the feed into No. 2 Dorr 20-ft. diameter bowl and rake classifier. About 30 percent of the washing plant output is handled through this classifier, which has a slow rate of rotation in order to classify and recover a very fine product. The product moved up the drainboard discharges into ground storage and about 2½ percent solids are overflowed with water into the hydro-separator.

The hydro-separator also receives, in addition to the overflow from both Dorr classifiers, the overflow from the sand drag and from the six Allen cones. Its function is one of classification, to recover as much of the extreme fines as it is practical to handle in producing dried phosphate. Product of the machine is 60-mesh to 200-mesh, but it is much more toward the finer sizes than the product from the Allen cones. Anything finer than 200-mesh would be largely lost as dust in drying the material later in the process.

Fines recovered are pumped by a 4-in. pump to the sand screw washer and find their way into the No. 2

Dorr classifier. Probably 90 percent of the overflow solids are minus 300-mesh, representing 40 t.p.h. It contains only about 30 percent B.P.L. and is wasted. It is pumped to a one of two ponds, in series, where the water is clarified for re-use.

High and low grade green phosphate could be processed separately, with the type of raw material storage system now in use, but the practice is to blend the finished products in storage instead. Low grade material, if fed separately, would require the passage of less material through or the use of greater volumes of water.

Water Conservation

However, water supply is not abundant in the Mt. Pleasant district and becomes scarce in the late summer. For that reason a wet storage capacity of 20,000 tons of clean, washed phosphate is provided for depletion when the water supply becomes low. Water is taken from nearby Quality Creek and from the settling ponds.

The plant requires 3000 g.p.m. for operation. A 500 g.p.m. high pressure pump furnishes water at 60 p.s.i. at several points where pressure and a small quantity is desired—at the grizzly, rolls, etc. Two 6-in. pumps furnish the main volume of 2500 g.p.m. at 18 p.s.i., into the scrubbers, sand scrubber, elevator tank, sand drag, etc.

While none of these improvements to the flowsheet represent radical changes in operating procedure, they have contributed to an increase in capacity of about ten percent for the washing plant. Having an uninterrupted rate of feed into the washing plant is the main reason for this increase. A uniform flow throughout has added to the efficiency of each classifying machinery all the way through to the hydro-separator which now has a regular percentage of pulp fed into it.

Until 1939, the plant was powered partially by steam. It has been entirely electrified, with individual electric motor drives on all equipment following the first scrubber, or dasher (see flowsheet). A single 150-hp. motor drives this dasher and the equipment preceding it.

Markets

A stiff-leg clamshell handles the wet finished product into storage from the open pit where it is discharged. Some undried phosphate is shipped as such and loaded by loco-

motive crane direct from stockpiles into gondola cars. Considerable tonnage is dried and sold unground. Less than 50 percent of the dried product is ground. About 80 percent of the ground, 85 percent passing 300-mesh, is sacked.

When drying phosphate, the stiff-leg clamshell fills an 80-ton hopper, from which a belt conveyor feeds the dryers. There are two Ruggles-Coles dryers (one 6-x 35-ft., and one 7-x 30-ft.), coal-fired by Detroit stokers, that can dry 350 tons of phosphate in 10 hr. to a moisture content of one or two percent. In stockpiles, the phosphate is first drained to 15 or 20 percent moisture.

Preparatory to grinding, plus ¾-in. from a vibrating screen is put through a No. 2 Sturtevant gyratory crusher and minus ½-in. is fed to three Raymond 5-roll high side mills. The third one has a whizzer separator and was recently installed. A 4500 c.f.m. bag-type Sly dust collector just installed is connected to the cyclone vents. A second collector is to be put in to catch the dust from around the bag packer.

Officers of the company are H. Earl Hoover, president; R. P. Hoover, honorary president, and H. S. Demaree, vice-president and secretary. R. S. Morrison is superintendent; W. F. Hudson, chief engineer; O. H. Wustrack, chemical and plant engineer, and J. W. Rowell is assistant engineer and chief chemist.

Tennessee Phosphate Company Improvements

HOOVER & MASON PHOSPHATE CO., Mt. Pleasant, Tenn., has completed installation of a new bagging machine with belt conveyors to stock house and direct to freight car siding for loading, complete with automatic weighing and counting devices, increasing the capacity four times. Two new mills also have been purchased.

Tennessee phosphate production in 1942 amounted to nearly 1,500,000 tons. Shipments of ground rock from Tennessee into consuming channels so far in 1943 have increased 60 percent over the first quarter of 1942. In 1942, about 230,000 tons of ground rock phosphate for direct application to the soil were shipped from Tennessee, of which 128,000 tons were used by Illinois alone.

Change Name

WAPELLO STONE CO., Ottumwa, Iowa is the new name of the stone quarry business operated by Ben Ravitz as the B & M Quarry, 114 N. McLean street.

Lime Kiln Energy Streams

Diagrams depict heat interchange and energy flow in lime kilns

IT IS IMPOSSIBLE to understand lime kiln performance unless one possesses a fair mental picture of the heat interchange and energy flow processes. All sorts of misconceptions may occur, and even new kiln designs fall to prove out because the designer had no clear idea of what he was actually confronted with.

A heat flow, or energy interchange diagram, is a great aid in understanding kiln functioning; and in this article we propose to build one up, unit by unit. It is our hope that the reader will follow us through and not, unless he is unusually well

By VICTOR J. AZBE*

informed, just glance at the final figure and let it go at that. We want to assure him that mastery of the Heat Flow Diagram not only will make his work more interesting through a better understanding, but also will be conducive to making his plant operation more profitable as, after all, there are losses; and a knowledge of precisely where they are, and why they are, should enable one to minimize them.

In Fig. 1 we present diagrammatically a kiln with three main zones,

the preheating, calcining and cooling zones. In many kilns the cooling zone is non-existent, particularly in many rotary kilns. We start with a certain amount of heat in the fuel, it may not be heat yet for that matter, just potential energy, but we can portray it very readily as heat. So this heat pours into the kiln as a stream.

One of the initial losses from this stream is that of latent heat vapor, brought on by combustion of hydrogen to form water. Natural gas may have a heat content of 100 B.t.u., but it is a high hydrogen fuel and so about 10 percent of the heat becomes latent. This heat, so far as a

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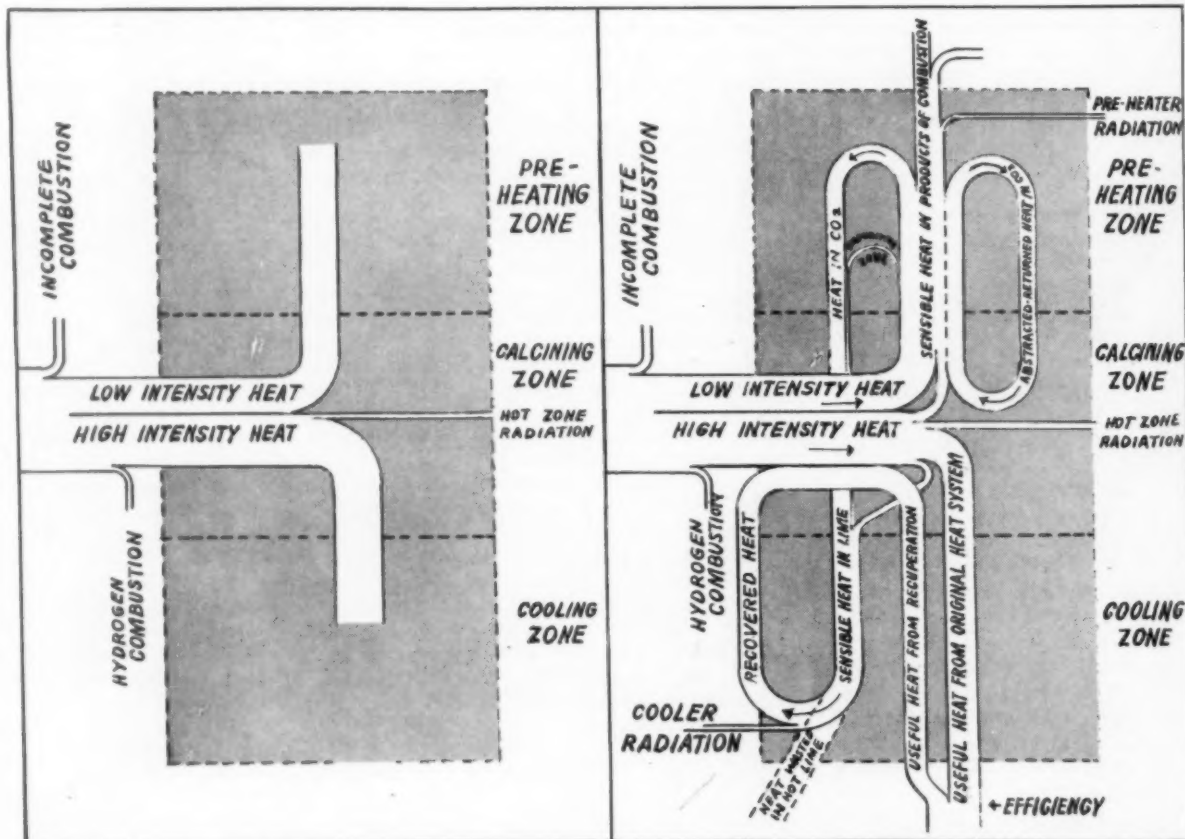


Fig. 1: Kiln with three main zones; preheating, calcining, and cooling zones

Fig. 2: This is an improvement of Fig. 1, elaborating on the preheating process

in a closed circuit. What is absorbed from the heat stream in the preheating zone is returned to it in the hot zone and balances out the other. The heat of the escaping CO_2 from one batch of lime preheats the CO_2 in the stone of another batch of stone, so that the heat of CO_2 preheating, once the flow is established, becomes a separate entity, and the low intensity stream coming up the kiln is utilizable only for the preheating of CaO portion of the stone plus, of course, the impurities, as well as the little necessary to drive out the moisture.

The heat of preheating of CaO portion of limestone, as well as that imparted to impurities, or what is to be core, plays a far more important part and may be responsible for efficient or inefficient operation, all depending upon which way the stream is directed.

In the upper parts of the kiln, as shown by Fig. 2, the stream of heat energy starts downward, grows, and is enriched by sensible heat abstracted by the impurities. It is further enriched from the stream of high intensity heat as the lime passes through the hot zone, so that it is quite a substantial stream when it reaches the cooler.

As indicated in Fig. 2, it is recovered; or it may be wasted, as shown by dotted lines. If the lime is drawn hot, its sensible heat is lost through cooler wall radiation. It can be utilized to preheat air for combustion. In the latter case this heat stream is reversed and brought back into the hot zone as part of the high intensity stream. If so brought back, the kiln efficiency is raised, roughly, one-third.

This is all shown in Fig. 2 and should not be hard to understand. If the air necessary for combustion is not heated to hot zone temperature with sensible heat from the lime, it will be heated from the high intensity portion of the main stream, thus greatly lessening the amount available for the calcining process.

Wasted Heat Energy

Fig. 2 also shows what goes on in the upper kiln section. A small radiation loss from the heat stream deviates, but that is not very serious, since its origin is the low intensity main stream containing more heat than can be utilized.

Then at the top two more heat streams pass to waste, the first constituting the remaining sensible heat of products of combustion, such as could not be utilized in the process of

preheating the stone, not necessarily because there was not enough stone, but rather there was not enough stone passing down the kiln in proportion to heat passing up the kiln.

Not the height of the kiln is what determines the exit gas temperature and heat content, but rather how efficient the hot zone is in conserving heat of high intensity for purposes of calcination. For example: If by complete recovery of sensible heat in the lime we increase the ratio of lime to fuel by one-third, then one-third more stone comes down the kiln, and naturally, the escaping gases will be cooled by that much and the escaping heat stream reduced; otherwise nothing much can be done about it.

That, however, is not the case with the second heat stream departing at the top, that of heat carried to waste by excess air. Of course much depends on where the excess air enters the kiln; if it enters in the upper kiln section, the heat it contains is of no great consequence, being what might be termed "spent heat." If, however, it enters anywhere in the hot zone section, the matter is serious; and if the excess air is much the loss may be very great. Thus 100 percent excess air used for burning of fuel will reduce the fuel ratio by a minimum of half, if the cooler is not functioning as a recuperator.

In Fig. 2, the excess air heat stream originates in the hot zone from the high intensity portion and passes up and out to direct waste. With this loss, the remainder of high intensity heat is less and so lime making capacity is correspondingly reduced.

Heat loss from excess air is as serious, or even more so, than that caused by incomplete combustion. In one case the potential energy is not converted into heat, in the other it is, but wasted. Some excess air is needed to assure complete combustion, but in properly designed and operated kilns this is not much. This applies to both vertical and rotary kilns.

Combustion should be complete before the gases enter the preheating zone, and it is really the junction between the calcining and preheating zones from which the gases should be withdrawn for analyses, for determination of their oxygen and carbon monoxide contents.

Heat Chart for Dolomite

Fig. 3 shows a still further developed diagram. In essentials it is very much the same as Fig. 2 except

that the magnesia (MgO) zone was added. This zone is distinctly separate from the calcia (CaO) zone of a kiln, for the initial dissociation points of the two carbonates are 500 deg. F. apart, being lower for magnesia.

Here there is a third stream of physical heat converted into chemical energy coming down the kiln, that of MgO . In addition, the sensible heat stream is also much greater because it is enlarged by the sensible heat portion of the high specific heat of MgO . To the extent represented by this 500 deg. dissociation temperature difference, plus the preheating effect of MgO , heat is taken from the gases of the calcium kiln proper; and only for the additional difference (and there is a difference) does the magnesia zone draw on the high intensity stream.

So it can be readily seen why the dolomite kiln, because of the economizing effect of the magnesia zone, should have a much higher lime to fuel ratio than the high calcium lime kiln; yet ordinarily the ratios are inferior. Although additional quantities of heat are recovered by the magnesia zone, greater quantities are wasted by incomplete combustion, excess air streams, and failure to recirculate back into the hot section of the kiln the sensible heat of the lime.

Fig. 3, is divided into five main zones: initial preheating, magnesia calcination, calcia (CaO) preheating, calcia calcination, cooling zone. In addition there are two intermediate zones, which have never been mentioned. These are not found in old-fashioned kilns, nor in kilns now driven at high capacities. In low capacity kilns they may take up considerable of the height. These intermediate zones are where stone preheated to the gas temperature is held there for the time being with no interchange of heat.

Anti-Strip Agent

Solving the problem of "stripping" of bituminous mix aggregates is one of the claims of the product called Kotal which is described in a 15-page bulletin. In the presence of a very small amount of lime, it is said that a small quantity of Kotal seals and conditions the surfaces of damp or even water-soaked paving aggregates in such a manner as to cause the surfaces of these aggregates to prefer bitumen to water. Inland Asphalt Corporation, Chicago, Ill., has issued the booklet.

How to Obtain Accuracy in Sampling

Concluding article describes experimental method of sampling to attain accuracy

By CHAS. DEMOND*

A SUPPOSEDLY EASY KIND of experimenting has been considerably used—the cut-and-try method. But, if it is to guarantee correct samples, this method is not really easy when the sampling is in more than a single stage, as it commonly is. It is apt to become long drawn out, tedious and discouraging. Such drudgery is practically always abandoned; and the final plan may become merely a set of what is hoped are safe guesses. This is well illustrated in the case of two custom plants that sampled a certain gold ore on which neither could check itself. The weights for certain sizes in the two cases are shown in Table 2.

Mill "A" apparently took too little ore at 2 in., but increased its care as the crushing became finer; while "B" used its greatest care at the coarse stage, but dropped off much more rapidly than "A" toward the fine sizes. With the trends shown, "A" would take only half as much ore as "B" at 2 1/3 in.; but at 6/10 in. it would take twice as much as "B," and at 1/8 in. about ten times as much. The trends point to 30 assay tons for mill "A" at 150-mesh, but only 1/10 assay ton for mill "B."

Examination of the practice in a large number of mills shows a great diversity of schemes; but, while some are well laid out, there are others that do not seem to show any real grasp of the problem. When sampling equations are calculated to fit these various practices, it is found that "a" varies all the way from 1.00 to 4.32. In each case where the value is over 3.00 it appears as though the designer felt that a large quantity taken by the first cutter guarantees the accuracy of the final sample, regardless of what is done later; and so the percentage taken at later stages is

*Until his death about a year ago, Mr. Demond had been with the California Portland Cement Co. for many years. He had made the study of sampling a matter of close personal interest.

rapidly reduced. In each case the logic of the work points to ridiculously small weights for chemical analysis at 150-mesh (0.05 gram and less).

A number of men of wide exper-

● *Article in the March issue of ROCK PRODUCTS outlined the basic principles of sampling and described how an accurate analysis may be made from a one-gram sample.*

ience and observation have said that too many sampling plants are laid out in a hit-or-miss manner rather than by any definite rule. The problem, then, is how to determine the proper procedure. A systematic and expeditious method was worked out some years ago.* It makes no theoretical assumptions about the rock under examination; nor does it attempt to

turned over to untrained men, any more than can the exact work of the chemical laboratory. The mathematical analysis of the experimental facts is of the same kind as used to guarantee safety to the huge investments for insurance; and of the sort used in various other directions to secure careful control of operations. Just as the insurance specialist must have his basic information to start with, so also there are basic facts, about any material that is to be sampled, which must be known before the sampling process can be correctly laid out; and experiment is the only means for getting the facts.

At each of three or more stages of crushing take at least ten separate cuts of the well mixed rock, by careful riffing, each cut to be of exactly the same weight but too small for an accurate sample. Table 3 suggests quantities for this purpose at certain sizes, both for fairly uniform material and for distinctly non-uniform material.

For silver or gold ores thirty times these weights will be used.

TABLE 2—DIVERGENT PRACTICES

	Pounds at					
	2-in.	1-in.	1/2-in.	1/4-in.	1/8-in.	"a"
Mill A	1000	500	250	125	62.5	1.0
Mill B	1680	420	104	26	6.5	2.0

estimate the number and size of particles of any constituent. It lets experiment automatically register the net effect of all the qualities of the rock. Moreover, though Table 1 indicates differences suited to different types of material, yet the only way to tell what set of weights actually fit a particular situation is to start with effective experiment.

While the method now to be described is expeditious, it is not an off-hand procedure which can be

From each of these cuts a portion is sent to the chemical laboratory after grinding through whatever screen is regularly used for laboratory samples. The analytical results will not check well among themselves; but suitable calculations will show, for each cutting stage, what weight will

"Mechanical Sampling of Ore": Demond and Halferdahl in Eng. and Mining Journal-Press, Aug. 12, 1922.

This method was developed from extensive investigations covering several years. The method itself is to be credited to Mr. Halferdahl.

yield the desired accuracy. For example: if the average deviation of the chemical results is 0.5%, and the required accuracy is a deviation of not over 0.1%, then the necessary

TABLE 3—DEFICIENT EXPERIMENTAL WEIGHTS

	1-in.	¼-in.	1/16-in.
Quite uniform ore	4 lb.	4 oz.	¼ oz.
Quite non-uniform ore.....	320 lb.	6 lb.	2 oz.

weight of sample is twenty-five times that of each cut taken for the trials.

$$\left(\frac{0.5}{0.1} \right)^2 = 25$$

Having thus determined the proper weight for correct samples at each of the experimental sizes, further calculations give the values of "k" and "a" in the formula $W = kD^a$; and from this the proper weights are calculated for whatever set of sizes is to be used in regular sampling.

Table 4 shows data found by this method on several commercial materials, for a precision of 0.03%, except for gold, for which the precision is 0.01 oz. per ton.

The three copper ores were from the mines of Butte, Mont. They were chosen because of marked differences in copper content and in the physical distribution of the valuable minerals. Each of the first two contained less than three percent copper, in finely disseminated sulphides; while the third had more than seven percent copper, in quite coarsely segregated sulphides. The cement materials were from two California cement plants: the first a mixture of separately quarried limerock and shale; the second a mixture of separately quarried lime-rock, shale, silica and iron ore. The reason that "a" is not quite the limiting value (3.00) for these cement materials is that the minerals are not pure, and so neither of them is of uniform composition. If the mixture were of pure minerals, "a" would be 3.00, as is previously shown. The value in the gold ore was so much segregated that assays made on six "samples" from one lot, obtained by regular mill procedure, varied from 0.24 oz. to 0.76 oz. per ton. An investigation made on this lot showed that the trouble was due to the mill's not being equipped for fine enough grinding of so difficult an ore, or for taking large enough cut at the sizes

to which the crushing could be done. And yet the weight indicated by the derived formula for 150-mesh was almost exactly the one assay ton commonly taken for laboratory determination of gold. Thirteen one-assay-ton charges used in the laboratory checked within 0.01 oz. per ton in twelve of the trials, that is in 92 percent of the cases. One sample varied 0.03 oz. from the average. This meets the standard requirement that the results shall come within the specified limit of error in 90 to 95 percent of all trials. This strikingly shows that, even when the values are much segregated in an ore as it comes from the mine, they may be mixed to a uniform distribution when the 150-mesh stage is reached.

The variations among the copper ores suggest an important matter to be kept in mind—the question of being sure that large enough samples are always taken as shipments arrive from different sources. This requires that the designer shall have access to full information about the various ores of the district, and make tests on the most difficult material, that is on the ore that calls for the largest quantities, thereby making operation of the sampling mill safe for all shipments. In the case of these copper ores, therefore, he would choose 2.48 for "a" and 2100 lb. for "k".

If the required precision is less severe than the 0.03% called for in Table 4, the weights need not be as great as are there shown. For example, if the precision for the cement materials was for a limiting error of 0.10% instead of 0.03%, the value of "k" would be only 0.09 as great as shown in the Table,

$$\left(\frac{0.03}{0.10} \right)^2 = 0.09$$

or 1400 and 3030 lb. respectively.

It will be noticed that, for each case shown in Table 4, the investigation indicated just such amounts to be taken for chemical analysis, when grinding the final samples through

150-mesh screens, as all experience proves to be suitable. It was at first quite startling to find this kind of confirmation as to the soundness of the method used for investigation, since the finest size for the experimental tests was decidedly coarser than the 150-mesh.

Equipment and Operation

There are various pitfalls in putting to everyday use such findings as are described in the preceding section. There are sampling mills of sound design; but, on the other hand, strange devices and strange practices are found in some places.

As important as any provision in the mill design is the need to convert the intermittent cuts at one stage into a continuous stream of feed to the next stage. There is probably no better means to this end than a revolving drum feeder with intermittent lifting blades. A shaking pan feeder, properly arranged, also serves quite well. Careful investigation showed that the drum does more mixing than the pan; but each insures that, with proper speeds of the cutters, every portion delivered by one of them will contribute a suitable amount to the next. Absence of some such provision is dangerous in two ways: first, it reduces the weight of final sample because of many missed cuts; and, second, it makes the actual cuts at irregular instead of systematically regular intervals. In one plant it was found that from one to as many as six cuts in succession, from one stage, contributed nothing to the next cutter. The result was that the final sample averaged only 57 percent of the intended weight. Missed cuts convert the work into what is little better than mere random sampling; and will almost certainly lead to false, troublesome results.

Simplicity of mill design, so long as it does not violate any sound principle, keeps down both installation and operating costs; but no competent

(Continued from page 92)

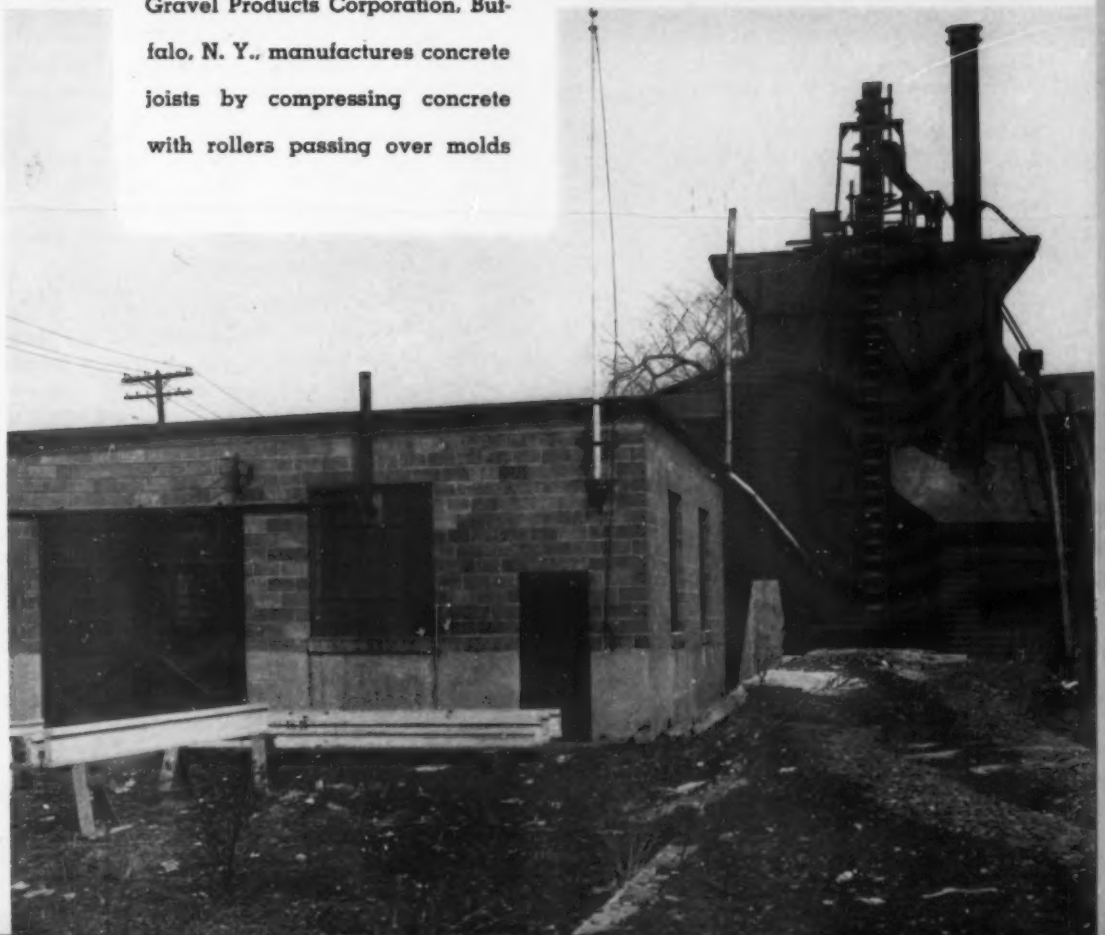
TABLE 4—ACTUAL COMMERCIAL DATA

Kind of rock	k	a	Weight for analysis at 150-mesh
Sulphide copper ore.....	600	2.32	0.8 gram
Sulphide copper ore.....	700	2.37	0.7 gram
Sulphide copper ore.....	2,100	2.48	1.1 gram
Cement raw material.....	15,600	2.95	0.6 gram
Cement raw material.....	33,700	2.88	2.0 gram
Spotty gold ore.....	576,000	2.90	1.07 assay ton

CONCRETE PRODUCTS AND CEMENT PRODUCTS

Rolling Concrete Joists off the Production Line

Gravel Products Corporation, Buffalo, N. Y., manufactures concrete joists by compressing concrete with rollers passing over molds

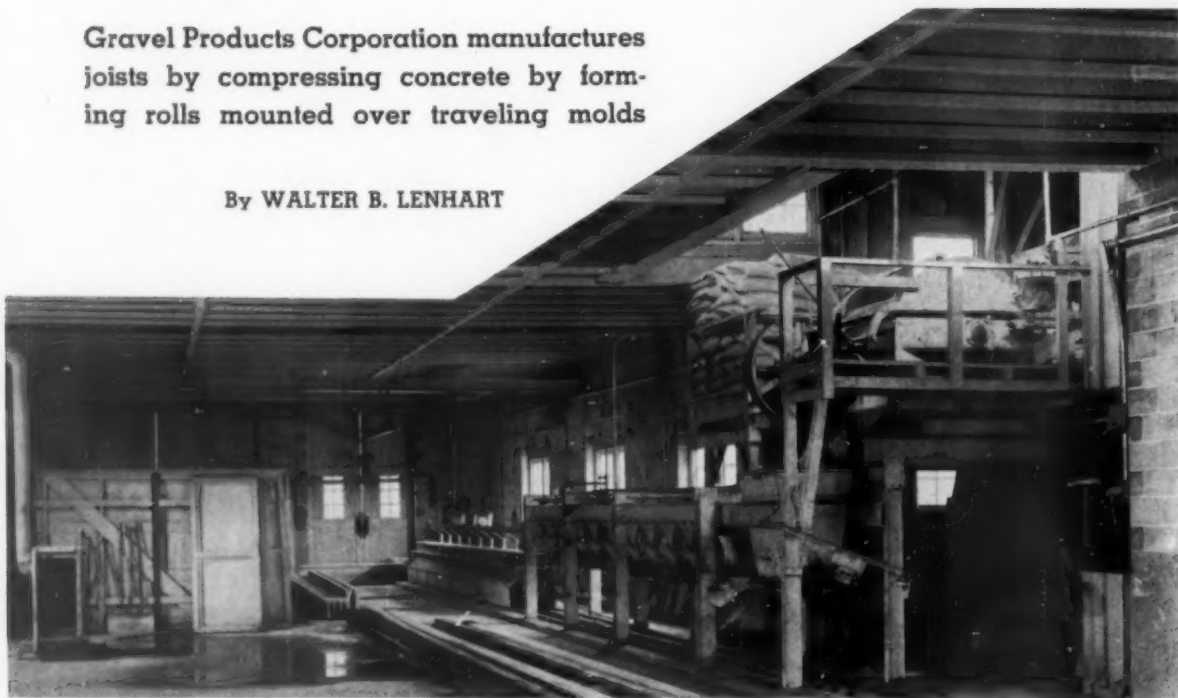


MASS PRODUCTION

Rolling Long Joists Off the Line

Gravel Products Corporation manufactures joists by compressing concrete by forming rolls mounted over traveling molds

By WALTER B. LENHART



Looking down aisle in joist plant. To the right may be seen the forming rolls that compress the concrete in the traveling mold and in the background the hoist which removes joist to curing room. On the platform is the mixer with chute to hopper which feeds the mold

LITH-I-BAR is the name given a machine-rolled, light-weight reinforced concrete joist which is being manufactured in the Buffalo, N. Y., area due to the foresight of E. M. Hammond, president of the Gravel Products Corp., producers of sand and gravel in western New York.

Operations also include a fleet of 28 ready mixed concrete trucks, a Dun-brick plant, and a concrete pipe plant. There are three ready mixed concrete plants, two in Buffalo and one at Tonawanda, N. Y. Other concrete products include burial vaults, electric conduit boxes, brick, and a concrete sheave of special design for a local war plant, details of which cannot be divulged.

This company realized quite some time ago that to stay in business one must be atune to the times and to find and use new uses for concrete products. Their latest addition was the construction of a joist plant using the standard Lith-I-Bar joist machine.

In selling this product, sales efforts have been confined to construction

work related to the war effort. However, within their shipping range are many new plants, rebuilding programs and enlargements, all related to national needs, from which the plant has enjoyed a new and profitable business.

Manufacturing Process

In the manufacture of this product the graded Haydite aggregate is used. The Lith-I-Bar reinforcing cages employed in this construction unit is the balanced type with tension and diagonal shear members conforming to the highest standard specifications. Each joist has twin bars of steel at the top and bottom with electrically welded stirrups spaced at regular intervals. The number and size of the stirrups depends upon the size of the joist wanted. These reinforcements along with the machine-rolled, light-weight concrete aggregate give a joist with a minimum of deflection and freedom from vibration.

Joists are made in a Lith-I-Bar machine. In this process the mold is

laid flat and travels under a series of rolls in such a manner that the concrete is subjected to 2000 p.s.i. pressure by a series of heavy forming rolls mounted over the traveling molds.

In operation, the mold is filled about half full of concrete as it is pulled under the distributing chute. The electrically welded cage is then placed in the concrete and adjusted to the desired position. The mold is then pulled under the loading point a second time and filled with an excess of concrete. The filled mold then passes under the forming and pressure rolls which compact it into a dense, compact unit perfectly bonded to the reinforcement. Means are also provided for trowelling the top surface as the mold emerges from the pressure rolls so that a very pleasing appearance is given the finished joist. After trowelling, the joists are then lifted off the carriage by an electric hoist and placed in the steam curing rooms for 24 hours. After steaming the joists are stored outside for at

The Homes War Bonds Will Build



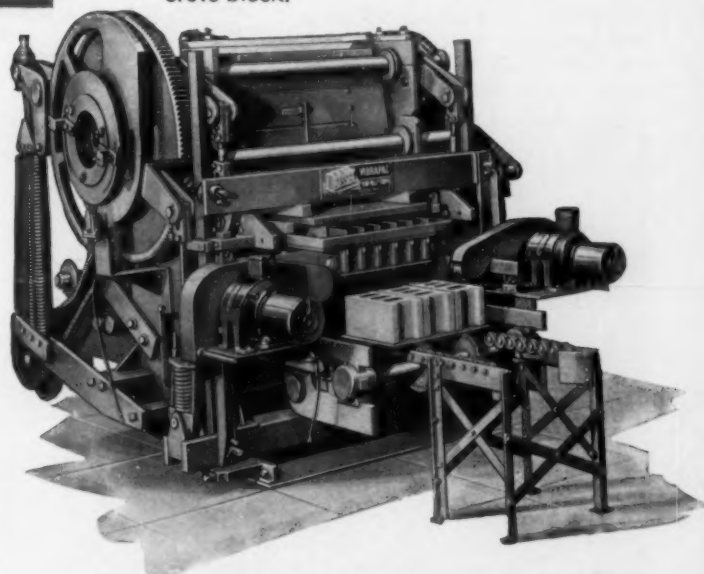
Besser Vibrapac Block

for BETTER CONCRETE MASONRY HOMES

During the present period when the Besser plant is producing war-fighting materials and Besser block machines are producing war building materials, private building has to wait.

In the meantime the whole nation is buying Victory Bonds to win the war. No small portion of this investment is already earmarked for building new homes.

After Victory, when the avenues of regular business are open again, still better Besser machines will produce still better block for better concrete masonry homes that these Victory bonds will build.



Besser Super Automatic Plain Pallet Vibrapac with Mixer and Skip Loader. Capacity 600 8"x8"x16" per hour made 3 at a time on one plain pallet. Smaller units made in large multiples on the same pallets.

BESSER PLAIN PALLET STRIPPERS

A Besser Plain Pallet Stripper For Every Need

TAMPERS	Besser Super Automatic	8 Hr. Capacity 3120
	Besser Victory Automatic	8 Hr. Capacity 2160
	Besser Semi-Automatic	8 Hr. Capacity 1680
	Besser Champion, Power Operated	8 Hr. Capacity 1000 to 1200
	Besser Multi-Mold, Hand Operated	8 Hr. Capacity 250 to 350
VIBRATORS	Besser Super Automatic Vibrapac	8 Hr. Capacity 4800
	Besser Victory Automatic Vibrapac	8 Hr. Capacity 2160
	Besser Master Vibrapac, Hand Operated	8 Hr. Capacity 800

THE TYPE OF HOMES WAR BONDS WILL BUILD

Buying Victory Bonds is not only a duty but the investment opportunity of a lifetime.

This is one of the many types of beautiful concrete masonry homes that will be bought after the war with Victory Bonds. It is an example of architectural beauty possible in a small home built with Besser Vibrapac concrete block.



Important Patent Notice

Licensed under the Gelbman basic vibration patents.

Undirectional vibration licensed under Flom patents.

The Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

BESSER MANUFACTURING CO.

205 Forty-Third St.

Alpena, Mich.

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

least seven days. Tests show the concrete to have a compressive strength in excess of 5000 p.s.i.

The machine makes joists from 6-in. to 14-in., and up to 36-ft. in length; a 14-in. joist can be made every 8 minutes. The standard FX Haydite aggregate and lake sand are delivered to the plant in trucks that dump to a bucket elevator serving a three-compartment Butler bin. A two-compartment Butler weighing batcher is ahead of the mixer. Cement in sacks is used. Four men can operate this plant handily.

In mixing the Haydite and sand in the 30-cu. ft. Besser mixer, each batch has incorporated in it one pint of soluble oil. Before adding this oil, one pint of it is diluted with two pints of water. This unusual additive agent is said to improve the workability and to give the concrete a smoother finish. The forms are treated with a mixture of kerosene, grease and stearic acid. This mixture is sprayed on the molds and pallets.

Reinforcing Welded in Company's Shops

Reinforcing cages are made up at the Gravel Products Corp's plant. One man can make 16 to 17 cages per 8 hours, each 27-ft. long, pro-



Concrete joist plant is constructed of concrete block masonry with roof supported by products of the plant. Aggregates are received by truck and elevated from hopper three-compartment bin by bucket elevator

vided he has a little help to remove the cage from his welding bench. An a.-c. electric welder of the Westinghouse type is used along with Westinghouse electrodes. One of the above cages will require from 9 to 12 welding rods.

The light-weight joists are easily handled once they are on the job and are set in position according to detailed specifications supplied by the manufacturer. It provides a fireproof

floor or roof system averaging 33 to 40 lb. per sq. ft. of area, thereby reducing column and beam requirements. The initial costs of the joists are such that they can compete with any structural unit of similar usage in the Buffalo area. Costs will vary with spans, loads, sizes, etc., but joists have been supplied on jobs for as little as \$.09 per sq. ft. of floor space.

Speed in field work is higher than



Close-up of forming rolls and mixer, showing two-compartment weigh batcher above platform



Typical installation in a modern residence where exposed concrete joists were used

with most similar structural units and in many cases plastered ceilings can be eliminated entirely as these joists have a very pleasing appearance in themselves as testified to in the 34-ft. roof spans at the plant.

The company does not manufacture the concrete slabs used with the Lith-I-Bar members, but it has a working agreement with other concrete slab manufacturers in this district.

The offices of the company are located at 99 Miami St., Buffalo, N. Y. E. M. Hammond is president, and J. W. Callahan is production manager.

Large War Construction Contracts Being Placed

BIG CONTRACTS are still being placed by the War Department for airport expansion, hospitals, and training centers. Typical of these authorizations for construction is an Army Air Forces installation in Los Angeles County, Calif., to cost in excess of \$5,000,000, and an Army General Hospital in Santa Clara County, Calif., to cost about \$3,000,000. A contract has been awarded in excess of \$2,000,000 to M. J. Boyle and Co., Chicago for construction in connection with expansion of an Army Air Forces installation in Greene County,

Ohio. Authorization for construction has been announced in connection with the expansion of an Army Air Forces installation in Grant County, Washington, to cost in excess of \$3,000,000. Another authorization has been issued for the expansion of an Army General Hospital in Clinton County, Iowa.

As of April 9, the total value of all construction projects which have been halted by the War Production Board amounted to \$1,327,286,920. This is a very impressive back-log of work which awaits termination of the War or present emergency conditions. In spite of the fact that preference ratings have been withdrawn for a large amount of construction, a considerable number of jobs are being released. During the week of April 9, for example, \$3,413,484 in total cost of projects had been released by W.P.B. for immediate construction.

A.S.T.M. Annual Meeting in Pittsburgh

ANNOUNCEMENT has come from the American Society for Testing Materials that its annual meeting will be held at the Hotel William Penn, Pittsburgh, Penn., from June 28 to July 2, inclusive. In the nonmetallic branch of industry, papers will deal with heat of solution procedure for determining the heat of hydration of portland cement; increasing the reflectivity of standard portland-cement concretes by additions of hydrated lime; studies to develop an accelerated test procedure for the detection of reactive cement-aggregate combinations; strength variations in cement supplied by several companies to the same specification; and a simplified test for evaluation of mixing effectiveness of concrete mixers.

Describes Use of Lightweight Aggregates

THE SUPEROCK CO., Birmingham, Ala., has issued an interesting 40-page booklet on various applications of Superock and Waylite expanded blast furnace slag aggregates manufactured under the Brosius Patent. The booklet contains numerous tables and charts showing proper mixes, sound absorption and heat transmission comparisons of different materials, strength tests, etc. It is also profusely illustrated with pictures of different residential, commercial and industrial structures built of concrete products, using Superock aggregates.



Interior of aviation school building using 60-ft. concrete arches, 28-ft. bays with a monolithic concrete roof placed on concrete joists



The Employes of
STEARNS MFG. CO.
 have been awarded the
ARMY-NAVY "E"

"—an honor not easily won
 nor lightly bestowed"

*B*ECAUSE the men and women of Stearns have gone all out to support our fighting forces with the implements of Victory and because of the Excellence of their effort, the coveted Army-Navy Production Award has been bestowed on them; the first organization in the concrete products machinery field to win this honor.

It is with a sober sense of responsibility that the Stearns organization accepts the "E" insignia, as a challenge to still greater endeavor. It also acknowledges the fine support of its regular customers and the co-operation of its suppliers as important factors in the production record now given national recognition.

STEARNS
 MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, President

—now engaged 24 hours per day, 7 days a week, on the manufacture of war material and concrete machinery for war construction.

STEARNS

manufactures the famous Joltcrete vibration block machine, ramp type block and brick machines, batch mixers and skip loaders. Licensed under the basic Gailman vibration patents.

Taking the Concrete Block Plant to Job

Big Naval Training Station job involving three million block, large number of which were made in job-site plants, may point to trend in the future

An interview with
EDWIN JOHNSON

Vice-president, John A. Johnson Contracting Corporation

OLD CONSTRUCTION METHODS and materials have been radically changed or discarded entirely in the present war emergency building program. New materials, new methods, and a totally new conception of suitable housing for efficient living, is likely to sweep many old-fashioned notions into the limbo of the past when this emergency is over.

When the John A. Johnson Contracting Corp. was confronted with the problem of building a \$50,000,000 Naval Training Station in New York, requiring 3,000,000 concrete block, a survey revealed that local sources of supply could not definitely assure delivery of sufficient units within the time limitations of the job. This situation called for a radical departure from the accepted methods of procuring the concrete block. It was finally decided to erect demountable and movable concrete plants as close as possible to the job-site. The following important factors were studied:

1—Reasonable Rental. A high rental block plant, like an over-capitalized block plant, is practically foredoomed to failure.

2—Good Management. The management would be even more important than the rental basis, except that a high rental basis makes any kind of management futile.

3—Location of Plant. This type of plant should be set up, if possible, adjacent to a sand and gravel pit within reasonable distance of the building site to obtain a short haul and secure a dependable supply of properly graded aggregates. About 40 miles is the maximum distance under usual hauling conditions.

Tamper type machine
used in one of the temporary plants



This pit location will cut the cost of the sand and gravel about in half. Approximately two-thirds of the material cost of block is sand and gravel which should be available for about 90c to \$1.00 cu. yd.

As against the pit location basis, the building site operation increases costs approximately 18 percent before considering haulage costs. For a 40-mile haul, the cost would still compare relatively as well as the way this plant was situated. With a gravel plant available within 20 miles of the site, it would have given approximately 1½c lower cost per block.

4—Equipment. After making a decision as to what type of plant and what type of equipment is most efficient, one management and rental should be applied to the operation and the most modern machinery set up under one roof for economical operation. Auxiliary hand block-making equipment or a small power tamper should be available to assure some production during shut-downs caused by various contingencies. Spillage can be run through these small machines advantageously.

5—Transportation. In the average block manufacturing plant, a haulage cost of 1.6c per block for a five-mile haul is ample. In the case of the demountable plants which were built, a higher rental for equipment, delays in unloading at the job, congestion of roads, railroad pick-up of ce-

ment bags, and other factors incidental to high-speed war-emergency construction increased the delivery cost of blocks to between 2c and 3c a block.

6—Plant Construction. There is a natural advantage inherent in producing at capacity continuously and in the elimination of all sales expense on this type of operation, but it is probably entirely offset by the short term of operation, in this case, a minimum period of 60 days being a very difficult time in which to make such a plant pay. However, a period of 120 days is probably the maximum operating time even on a large project. On a short-term operation the use of fibre-insulation board, gypsum-board sheathing or a similar low-cost enclosure for the demountable plants may prove entirely practicable.

By making an analysis of all costs and recording the day-to-day overhead, comparing the market price and exact cost of blocks turned out by each shift, it is possible to set up charts showing the exact number of blocks it is necessary to produce to cover overhead and make a profit on a 60-day, 90-day, 120-day basis, etc.

It is also possible to show exactly which factors play the largest part in preventing a plant from making daily profits, and by analyzing them to decide whether they are *fixed factors* which cannot be eliminated, or *variables* which can be controlled.

PROJECT PLANTS

Rental costs and Management, once established, are fixed factors, while Raw Materials, Location, Transportation, and Construction are variable items. On the basis of experience on this job the overhead operating costs could be greatly reduced if it had been practicable to locate the entire plant in one of the permanent warehouses of the project.

Actual Plant Operation Results

On this Naval Training Station job, the John A. Johnson Contracting Corp. demanded from 18,000 to 20,000 block per day, but actually on one day up to 36,000 block were called for.

Two block plants were set up close to the site. Both of the plants were under experienced management from whom the equipment was rented.

Plant No. 1, the smaller of the two plants, had one tamper type block machine with a capacity of 6000 units per day when running two 10-hr. shifts. The mixer is a 40-cu. ft. Besser. Each mixer batch is sufficient to make 85 block. The tamper type block machine has a capacity of six units per minute.

During the first days of production at this plant there was a high breakage because $\frac{1}{4}$ -in. gravel was used (it amounts to little more than coarse sand) instead of the more desirable $\frac{3}{8}$ -in. gravel. The $\frac{1}{4}$ -in. gravel does not have the holding power of the $\frac{3}{8}$ -in. size.

A one-half ton electric hoist was used to haul cement bags from the truck to the second floor where they were emptied into the mixer. This

hoist is capable of hauling eight bags in a sling.

There were five curing rooms with a capacity of 750 blocks each. These rooms had tracks running through them on which the racks carrying the wet blocks from the tamping block machine were conveyed. The green block were kept under steam vapor from 20 to 24 hours. The same track also goes out into the field storage area where the block are stored for final curing.

Plant No. 2

This plant included two block machines. The smaller, tamper type, has a capacity of 1500 block in 10 hr. (maximum), but the larger machine, vibrator type, has a capacity of 4500 block in 10 hr. (maximum). The plant was equipped with a travelling bucket which carried the mix from the mixing machine to both block machines over a monorail. Both 8-in. and 12-in. wide block can be made on the vibrator type machine.

Under normal conditions the setting up of the building and equipment would have run about ten to twelve thousand dollars, but due to material and labor shortages encountered on this job, the cost ran somewhat higher.

At the No. 2 plant there were seven curing rooms which had a capacity of 1200 block each. Block were conveyed from the block machines to the curing rooms on a monorail. Block were subjected to steam vapor for from 20 to 24 hours. The mono-

rail then carried the block to the field storage area where they remained for one week in the final curing process.

Actual total production of the two plants averaged between 17,000 and 18,000 block per day when running two 10-hr. shifts.

Conclusions

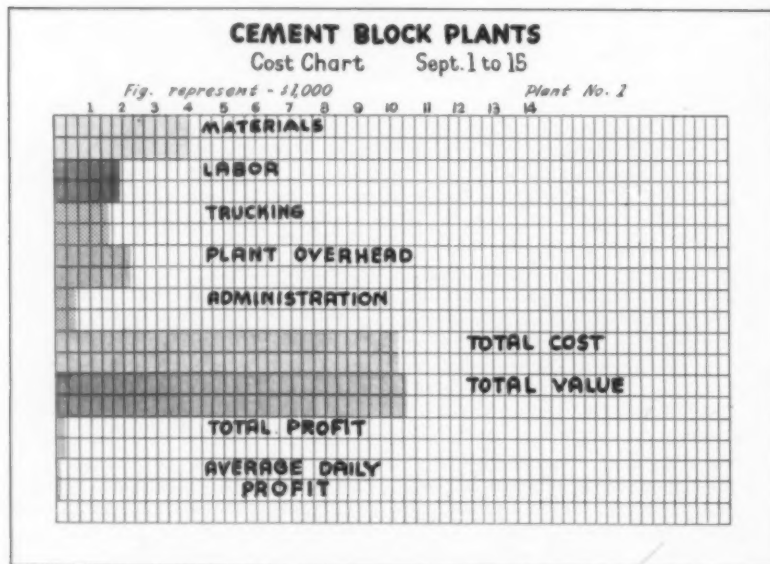
It has been estimated that the cost of moving a block an average of two miles will run from 1.3c to 1.5c. It is estimated that it will take about 20 to 25 minutes to drive from the plant to the location, and approximately 20 minutes to unload, providing labor is immediately on hand to take care of the load. It was estimated that a truck can make from seven to eight trips in ten hours.

Based on the actual cost of plant construction, which was increased by the necessity for speed, and the short operating period of approximately 50 to 60 days, the block average somewhat above the market price. The total production was 627,730 block, 231,675 of which were made in Plant No. 1 and 396,055 in Plant No. 2. This clearly shows that Plant Overhead is relatively high due to the short time of operation, and also to the necessity of maximum speed in the construction of plant buildings. The larger plant naturally showed greater Plant Overhead cost, although proportionate to other cost items, but based on a normal cost of plant construction, operating over a period of 90 days as planned, the larger plant should have shown an actual profit on the block produced.

The entire study of the two block plants bears out conclusions reached when the operation commenced that plants of this type set up for an operation of less than 60 days would be very difficult, if not impossible, to make profitable based purely on dollars and cents considerations, but that such operations carried over a basis of 90 days would prove profitable under most war-emergency conditions. The preliminary studies, outlined in the first part of the article, indicated in advance a very close approximation to the actual results of the two concrete block plant operations.

Major considerations in favor of the demountable and movable concrete block plant for large war-emergency projects are as follows:

1. Immediate availability of block to prevent delays in construction.
2. The high cost of delays which can be obviated by controlling a cer-



Cost chart showing break down of costs at Plant No. 1

tain amount of production of block. When labor is scarce, men cannot be laid off for lack of block.

3. The additional cost of building six storehouses with brick walls, due to a shortage of concrete block, would have more than paid off any loss of concrete block plant operations.

In conclusion, the possibilities of operating a ready-mixed concrete plant as a separate unit in close conjunction and under the same management as a concrete block plant offers possibilities of still further savings.

It should not be considered from the study of block plant operations above that the setting up and operating of "job-located" cement block plants is a procedure designed for other than war-emergency situations since under normal conditions a dependable local supply of adequate proportions is a simpler and preferable solution of the block supply problem.

Water-Proofing Concrete

EVERCRETE CORPORATION, New York, N. Y., is now introducing a transparent liquid, known as In-Mix, which is used as an additive in concrete to prevent efflorescence and scumming, according to the manufac-

turer. It is also said to cure faster, preserve, harden and waterproof concrete. The liquid is used in the proportion of $\frac{1}{2}$ gal. of In-Mix to each bag of cement.

California Cement Mills Operating at High Level

CEMENT is moving in large volume from the three Pacific Coast States, largely to military projects both on the mainland and other offshore points. The 21 active mills entered 1943 with a production rate 12 percent greater than the period immediately following Pearl Harbor, and 79 percent greater than at the outset of 1941. Operations for the 12 months ending in January 1942 were 85 percent of capacity for California plants and over 80 percent for Pacific Northwest plants. Average prices have increased in California from \$1.23 per bbl. in 1940 to \$1.56 per bbl. at the end of 1942. In the Pacific Northwest, price per barrel at the end of 1942 was \$1.95, or 13 percent above the 1939 price.

England Uses Precast Concrete for Railroads

WAR NECESSITIES have caused British railways to make increasing use of concrete to replace steel and wood. A recent issue of *The Quarry Managers' Journal* has a story about the manufacture of sleepers (ties over here), reinforced and unreinforced concrete drainage channels and covers, sections for portable shelters, fence posts, platforms, and coping of precast concrete. Most of the work is done by women.

More Housing Projects

APPLICATIONS for F.H.A. insurance for 53 multi-family war housing projects which would provide 4631 dwelling units for war workers were filed during March. The \$400,000,000 increase recently voted by Congress in the F.H.A.'s Title VI war housing insurance authorization is available both for projects developed under Section 608 and for one-to-four family structures financed under Section 603.

Industrial Sand Meeting in Chicago

NATIONAL INDUSTRIAL SAND ASSOCIATION will hold its annual meeting in the Crystal room at the Palmer House, Chicago, Ill., June 3 and 4. The Board of Directors will hold an open meeting on the morning of June 3, and the formal convention sessions will be held on the afternoon of June 3 and the entire day of June 4.



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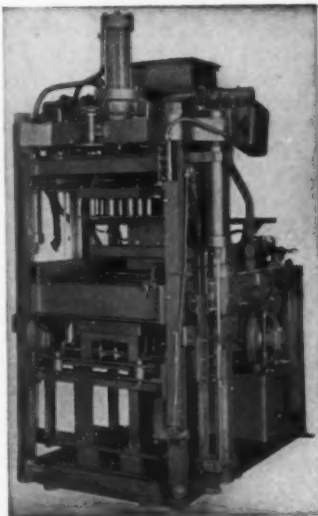
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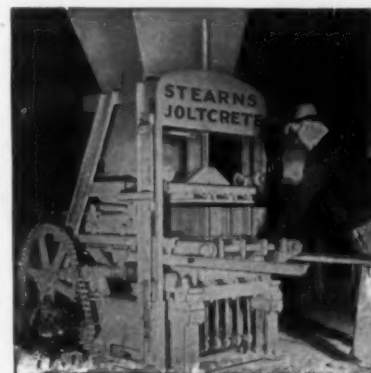
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Effect of Time of Haul on Strength and Consistency

Tests indicate lengths of haul within normal specification limits result in no reduction in strength

By GLENN C. COOK*

ALTHOUGH TESTS of the effect of length of haul on the strength and consistency of concrete have been made in the past, none have been made in recent years. In view of the changes in the characteristics of cement and changes in haulage equipment, it was decided to conduct a series of tests to develop the information considered essential for current specifications and industry practices.

Tests were made on concrete mixed in a stationary mixer and hauled over the streets of Louisville, Ky., in a truck-mixer-agitator furnished by the American Builders Supply Co. Prof. D. V. Terrell, Head, Department

Samples of concrete for test removed from mixer truck drum every 30 min. of haul by means of post hole digger



of Civil Engineering, University of Kentucky, and Stanton Walker, Director of Engineering, National Ready Mixed Concrete Association, assisted in planning the test program. Others cooperating in the tests

were Prof. W. B. Wendt and Prof. W. R. McIntosh of the University of Louisville.

The route over which the test runs were made presented average street and traffic conditions. Samples for test were taken at about 30-minute intervals until the concrete became quite stiff. The time of haul ranged from slightly more than two hours to more than seven hours.

Two groups of tests were made. Each group consisted of three batches of concrete, each made on a different day. The first group was made in late March and early April when air temperatures as low as 38 deg. were encountered; the second group was carried out in early July during a period when the air temperature was as high as 93 deg.

The concrete was made with cement and aggregates from the source of supply normal for the American Builder's Supply Co. The cement was a standard portland cement. Aggregates were sand and gravel from the Ohio River, used in a

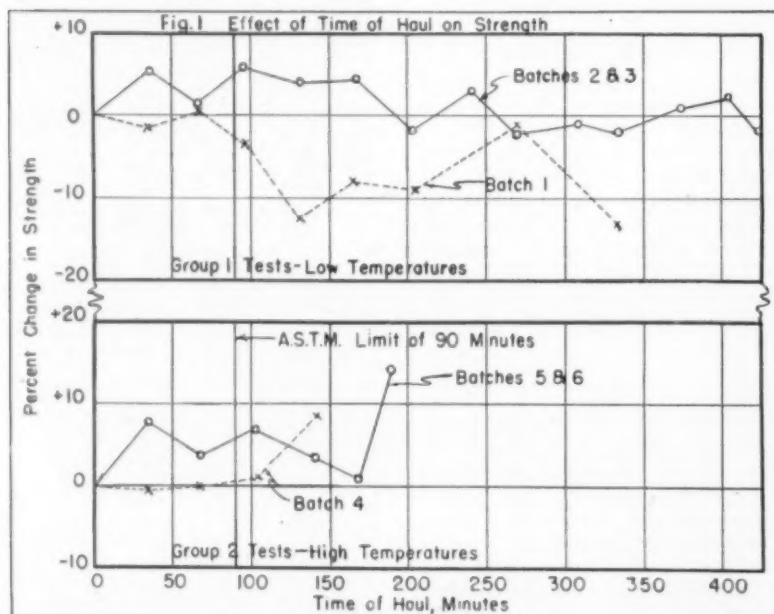


Fig. 1 demonstrates that for the conditions of the tests there was no detrimental effect on strength for any normal length of haul

*From a paper presented by Glenn C. Cook, American Builders Supply Co., at the convention of the National Ready Mixed Concrete Association and reported briefly in the February issue of **ROCK PRODUCTS**. The complete paper appears in the April issue of the *Journal of the American Concrete Institute*.

stream-wet condition; the gravel had a maximum size of 1-in. The concrete was proportioned to contain approximately 5 sacks of cement per cu. yd. and a slump of 4 to 5 in. Each batch consisted of 3 cu. yd. which was mixed for 2 minutes in an 84S Smith tilting mixer before being discharged into the truck-mixer-agitator.

The truck-mixer-agitator was a Jaeger horizontal type with a 135 cu. ft. drum, having a capacity of about 2¾ cu. yd. as a mixer and 4 cu. yd. as an agitator. During the hauling the drum was rotated at 4 r.p.m. The truck-mixer drum was in first class condition. After the truck was loaded and before the hatch was closed, a sample of 1 to 2 cu. ft. was taken. It consisted of a mixture of smaller samples taken through the hatch by means of a post-hole digger from different locations in the batch. Care was exercised to make the combined sample as nearly representative of the batch as feasible. After the first sample was taken the truck was driven over the prescribed route and returned to the point of sampling within about 30 minutes when another sample was taken. This procedure was repeated until the concrete became quite stiff. Samples of aggregates for sieve analysis, unit weights and for moisture and specific gravity determinations were taken as they were being weighed for the batch.

For each sample of concrete, slump



Making a slump test of ready mixed concrete sample taken every 30 min.

tests and three 6 x 12-in. cylinders for compression tests at 28 days were made. The cylinders were molded according to A.S.T.M. standards. They were cured immersed in water at room temperature until tested. For the first and last samples of each batch, wash analyses by the Dunagan method were made. Also, for certain of the samples in Group 1 a portion of the sample was retempered to the original slump and cylinders made for strength tests. Periodic measurements of air temperature,

concrete temperature and relative humidity were made.

Materials

The standard portland cement was from the same bin for both groups of tests. Tests of 18 samples by H. C. Nutting Co. showed the following average results: specific surface, 1930; 7-day tensile strength, 400 psi; 28-day tensile strength 520 psi; initial set, 3 hr. 30 min.; final set, 5 hr. 33 min.; sulphuric anhydride, 1.48 percent; magnesia 3.58 percent; loss on ignition, 0.61 percent; insoluble residue, 0.6 percent. The sieve analyses, specific gravities and unit weights of the sand and gravel are given in Table 1. As already pointed out the samples were taken at the time the concrete was batched. Only one sieve analysis was made for each batch for the sample thus secured. It is to be observed that both the sand and gravel were somewhat coarser for the Group 2 tests than for those of Group 1.

Proportions

The proportions (producing approximately 5 sacks of cement per cu. yd. of concrete) are tabulated in Table 2. It will be observed that the same proportions of dry materials were used for all batches except No. 4. On that day a full batch was mixed in the usual proportions but it was obviously granular and unworkable and it (3 cu. yd.) was discarded. The reason for the lack of workability appeared to be an excess of the intermediate gravel sizes, al-

TABLE 1. MISCELLANEOUS TESTS OF AGGREGATES
Tests of samples secured as aggregates were being weighed for concrete batches.

Batch		Percents finer than each size						Specific	Unit Wt.	
No.	Material	100	50	30	16	4	½-in.	1-in.	Gravity	lb. per cu. ft.
Group 1										
1	Sand	0.5	7.3	59.0	84.4	100	..	...	2.64	108.0
2	Sand	0.5	5.9	57.4	76.0	100	..	...	2.60*	110.0
3	Sand	0.5	5.8	55.0	77.3	98.4	..	...	2.64	109.0
Av.		0.5	6.3	57.1	79.2	99.5			2.63	109.0
1	Gravel	...	...	....	....	0	55	100	2.68	104.7
2	Gravel	...	...	....	....	2	62	99	2.67	107.3
3	Gravel	...	...	....	....	1	58	100	2.68	106.0
Av.						1	58	100	2.68	106.0
Group 2										
4	Sand	0.4	6.0	47.6	70.4	98.6	..	...	2.64	110.0
5	Sand	0.0	4.6	34.8	71.8	99.6	..	...	2.64	109.0
6	Sand	0.2	7.1	37.9	69.3	98.8	..	...	2.64	107.5
Av.		0.2	5.9	40.1	70.5	99.0			2.64	108.8
4	Gravel	...	...	....	....	0.2	46.6	86.3	2.68	107.1
5	Gravel	...	...	....	....	0.2	43.8	92.0	2.68	107.7
6	Gravel	...	...	....	....	0.4	45.7	90.2	2.68	105.5
Av.						0.3	45.3	89.5	2.68	106.8

* Doubtful value.

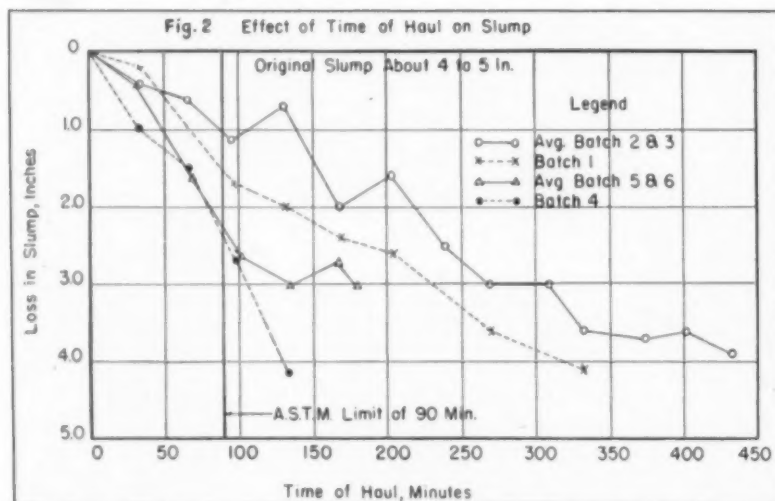


Fig. 2 indicates there was a gradual, but consistent, decrease in slump from the beginning of the haul. Rate of decrease seems to be affected by temperature of concrete

though that condition is not clearly revealed by the sieve analyses. At any rate, another batch with a higher proportion of sand was substituted. The quantity of mixing water shown in Table 2 is reasonably uniform for each group of tests. The amount of added water is known accurately.

Strength

The effect of length of haul on strength is summarized in Fig. 1. Where the same time of haul is given for different batches it is accurate to within at least 2.5 percent or 2.5 minutes. That is to say, for each group of tests, times of haul within 5 minutes, or within 5 percent of each other, whichever was the greater, were averaged to facilitate tabulation.

Fig. 1 demonstrates clearly that for the conditions of these tests there was no detrimental effect on strength for any normal length of haul. In fact, within the 90-minute limit of the A.S.T.M. specification, a limit common in other specifications, substantially all of the strengths after haul were higher than the initial strengths. Further, it is most important to note that for excessive hauls, continued until the concrete had attained an excessively low slump, only isolated reductions of strength in excess of 10 percent were obtained; there were only 2 cases (both from the same batch) outside the 10 percent band and comparisons of these values with companion ones suggest that one of them was more than likely due to errors of sampling, molding or testing.

As pointed out, the cement used

was a standard Portland cement. It is recognized that general, categorical conclusions cannot be drawn from these data in the absence of tests of

TABLE 2. BATCH WEIGHTS

Weights of aggregate on dry basis; weight of water includes surface moisture of aggregates.

Batch No.	Cement	Weight in lbs. Sand	Gravel	Water	ratio by volume
Group 1					
1	1410	4176	5940	1004	1.07
2	1410	4176	5940	935	1.00
3	1410	4176	5940	950	1.01
Av.	1410	4176	5940	963	1.03
Group 2					
4	1410	4755	5362	908	0.97
5	1410	4176	5940	904	0.96
6	1410	4176	5940	920	0.98
Av.	1410	4369	5747	911	0.97

other cements and, particularly, high-early-strength cements. However, these tests confirm results of

earlier tests and the comprehensive, but uncorrelated, experience of producers and users of ready mixed concrete.

Slump

Fig. 2 indicates there was a gradual, but consistent, decrease in slump from the beginning of the haul. The rate of that decrease in slump seemed to be affected principally by the temperature of the concrete, and to some extent by the relative humidity of the air. For the early spring tests (Group 1), the slump was reduced about 1 to 1½ in. from the original 4 to 5 in. during a 90-minute haul; for the summer tests (Group 2) the reduction was about 2½ in.

However, it should be emphasized that these reductions in slump were not accompanied by corresponding reductions in workability or placeability. Unfortunately no method for measuring actual workability was (or is) available and the preceding statement must be based on visual observation. As the concrete was hauled it took on a more "fatty" and more plastic appearance and "feel," which did much to compensate for, if in fact it did not completely compensate for, the loss in slump for hauls of usual length.

It has been suggested that this increase in apparent plasticity might be due to grinding of the aggregates and the cement. Such action may offer a partial explanation. However, for these tests, as will be discussed later, it is believed that grinding was a minor, and perhaps negligible, factor. A principal factor is believed to be the absorption of the mixing water by the cement and the better incorporation of the water with the cement. As already pointed out, the aggregates were "stream-wet" and, therefore, absorbed no water.

(Continued on page 80)

TABLE 3. SUMMARY OF DUNAGAN WASH ANALYSES
Each result is average of three tests.

Test No.	Length of haul, min.	Percent of solids, by weight								
		No. 100			No. 100 to No. 4			+ No. 4		
		Batch*	Begin	End	Batch*	Begin	End	Batch*	Begin	End
1	327	12.2	11.9	13.4	36.2	35.2	33.9	51.6	52.9	52.7
2	436	12.2	11.8	12.8	36.2	35.6	36.5	51.6	52.6	50.7
3	405	12.2	11.9	12.4	36.2	36.5	35.9	51.6	51.6	51.7
Av.		12.2	11.9	12.9	36.2	35.8	35.4	51.6	52.3	51.7
4	135	12.2	11.8	11.6	41.2	39.1	37.5	46.6	49.1	50.9
5	166	12.2	12.3	12.0	36.2	35.4	34.8	51.6	52.3	53.2
6	180	12.2	11.6	12.2	36.2	31.4	29.8	51.6	57.0	58.0
Av.		12.2	11.9	11.9	37.9	35.3	34.0	49.9	52.8	54.0
Grand Av.		12.2	11.9	12.4	37.0	35.5	34.7	50.7	52.5	52.8

*Materials as weighed into batch, uncorrected for sieve analyses.

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From THE WALL STREET JOURNAL: Washington Bureau
WASHINGTON—War housing still is a big business.
It promises to keep the home construction industry operating this year at nearly two-thirds of 1941 level, according to a new survey.

**EXTRA!
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This means more concrete blocks . . . and to meet war housing specs they must be the best that can be made, those are the kind of blocks that the block maker gets when he uses "Commercial" Presteel Pallets.

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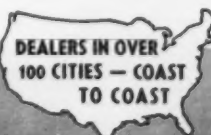
HOW TO GET LONGEST SERVICE FROM YOUR JAEGER TRUCK MIXERS:

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Temperature vs. Slump

Casual inspection of the data indicate the rate of decrease of slump to be greatly affected by temperature. That suggested the possibility

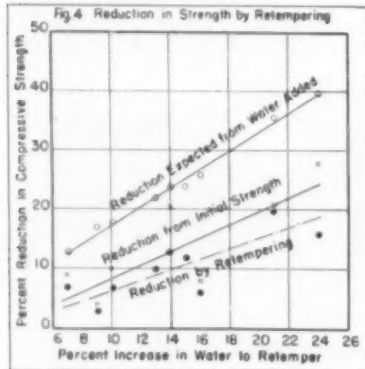


Fig. 4: Showing the effect on strength of retempering samples of concrete with water to restore the original slump

of a relationship such as shown in Fig. 3, where the decreases in slump for each batch and each period of sampling are plotted in relation to a "degree-hours" factor. The "degree-hours" were calculated by multiplying the average temperature of the concrete by the time of haul. For example, if the concrete started out at 58 deg. F., was 60 deg. after 34 minutes, and 62 deg. after 66 minutes, the "degree-hours" were calculated as

$$\frac{58 + 60 + 62}{3} \times \frac{66}{60} = 66,$$

which seems to be a sufficiently ac-

curate short cut to suggest the relationship.

While the data are somewhat scattering, they arrange themselves in such a manner as to clearly demonstrate that a relationship exists. While the slope of the curve would undoubtedly vary with materials and equipment, it suggests that individual relationships might be worked out for different conditions of individual operations.

Some effect of humidity was observed, the tendency being for the slumps to decrease more rapidly on drier days. However, attempts to correct the "degree-hours" factors for humidity to obtain a better relationship with slump were only moderately successful. It should be pointed out that humidity should be expected to have a greater effect on these tests than on normal operations, since the hatch to the mixer drum was removed every 30 minutes for the purpose of taking samples.

Grinding

An attempt to develop information on the amount of grinding which takes place during agitation was made by means of "Dunagan Analyses" and using the equipment developed by the late Professor Dunagan. For the first and last sample of each batch separations were made, by washing, at the No. 100 and No. 4 sieves. The results are summarized in Table 3. The —No. 100, the No. 100 to No. 4 and the +No. 4 material are expressed as percentages by

weight of the total solid ingredients. For the record, and for purposes of comparison, the original batch weights are also given expressed in the same manner.

The results of the "Dunagan Analyses" are sufficiently consistent to lead to confidence in their "order-of-magnitude" accuracy. On the other hand, the differences between results before and after hauling are so small, and so erratic within the small range, that they do not permit of a quantitative measuring of the grinding. Almost any of the differences encountered might have resulted from normal variations in sampling. The data do suggest, however, that the amount of grinding was small.

Taking the averages of the three batches for each group, and taking the figures at their face value, it can be reasoned that, in the case of Group 1 tests where the time of haul averaged about 6½ hours, sufficient sand and gravel were ground to increase the —No. 100 portion of the batch about 8½ percent—an increase of only 2.8 percent in the "fines" in the sand. Similar reasoning would indicate that no grinding to the —No. 100 sizes took place for the Group 2 tests where the average length of haul was about 2½ hours. However, at least one inconsistency presents itself to detract from confidence in the results or, more accurately, from confidence in the applicability of the procedure for the purpose; in the Group 2 tests the amount of +No. 4 material appeared to increase slightly—which could only result from differences in samples.

Retempering

Retempering tests were made only in Group 1. For three samples from each of the three batches, water was added to a portion of the sample and it was remixed by hand. Sufficient water was added to restore the original slump. No retempering was done by adding water to the mixer drum. The results are shown in Fig. 4.

The reductions in strength due to retempering were considerably less than would be expected under normal circumstances from the amount of water added. The writer has speculated as to the reasons for that discrepancy without arriving at a satisfactory answer; it is too consistent to be an accident, since it occurred for each of the three tests of three different batches—9 tests in all. While the drum was water-tight, and substantially air-tight, the explanation may lie in loss of water by

(Continued on page 91)

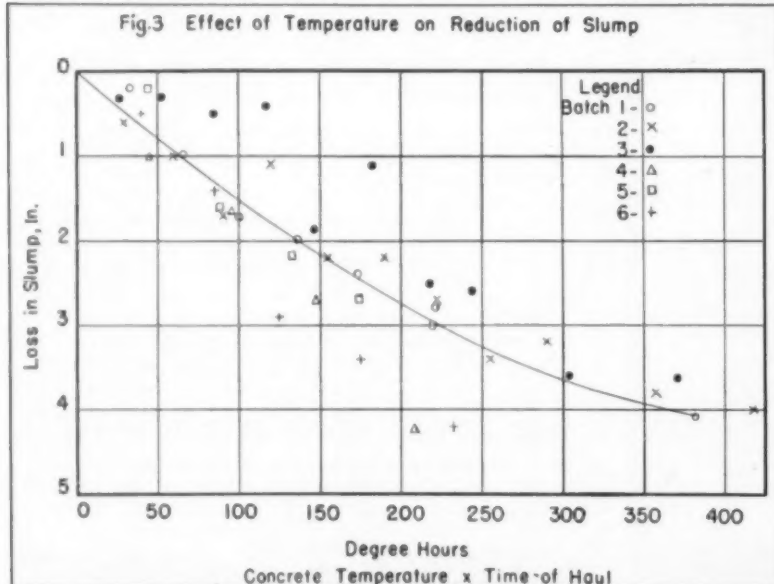
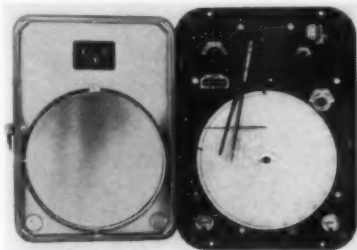


Fig. 3: Decreases in slump for each batch and each period of sampling plotted in relation to a "degree-hour" factor. "Degree-hours" are calculated by multiplying the average temperature of the concrete by the time of haul

NEW EQUIPMENT

Air-Operated Control

THE BRISTOL Co., Waterbury, Conn., has brought out an air-operated automatic control instrument, known as the convertible free-vane controller. This instrument is made for automatically controlling temperature (up to 3600 deg. F.) flow, liquid



Instrument for automatically controlling temperature, flow, pressure, and draft humidity

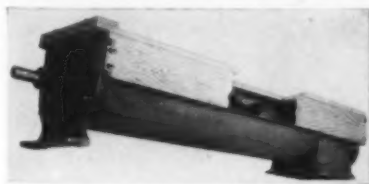
level, pressure, draft humidity, pH value, and time program.

The convertible free-vane controller operates on the same basic free-vane principle as that used in previous models offered by the company. In the convertible-type controller a number of design refinements have been incorporated, which simplify the instrument and make it more convenient to service. The instrument is also designed so that the user can convert from one type of control system to another.

It is offered in the following types: Monoset (On and Off), Ampliset (Throttling), Preset, Reset, and Magniset. Adjustments for fitting the controller to the requirements of the process are located on a dial board above the chart.

Screw Conveyor Trough Saves On Steel

LINK-BELT Co., Chicago, Ill., has developed a screw conveyor trough made of a combination of a steel trough bottom, wooden sides, and wooden cover board, lag-screwed to-



Combination wood and steel conveyor trough

gether to form a complete, tight enclosure for the screw and the material it conveys.

Considerable steel is saved with this design over the customary all-steel trough, and the new combination of wood and steel is adapted to all standard screw conveyor fittings. It will readily connect with an existing steel trough. The curved bottom is made of steel no heavier than No. 10 gauge, and has the added advantage of being removable by unscrewing of the lag screws securing it to wooden trough sides, thus facilitating cleaning and replacement.

Electronic Voltmeter

GENERAL ELECTRIC Co., Schenectady, N. Y., has announced an electronic crest voltmeter which is designed to measure ignition voltages of internal combustion engines; surge



Meter measures ignition voltage of internal combustion engines

voltages caused by corona and surface discharges in the insulation on motors, generators, and cables; and other repeated-impulse voltages up to 30,000 volts.

This instrument is suitable for field measurement, such as trouble shooting and the determination of actual operating conditions. The crest voltmeter can be used in areas where no electric power is available since it has a self-contained battery power supply.

Conveyors Employing Pulsating Magnet

SYNTRON Co., Homer City, Penn., has designed a line of long vibratory conveyor equipment in which the conveying action is accomplished by high speed vibration set up by multiple, pulsating driving magnets. The illustration shows a 35-ft. section

of a 130-ft. flat pan type conveyor for handling extremely hot materials.

With this type of conveyor there are no moving parts. Control of the rate of flow of material through the conveyor is by rheostat from either close by or from a remote point. It



may also be arranged for automatic control.

Pan-type conveyor trough with pulsating magnet units mounted below

Trough styles are supplied in either flat pan, as illustrated, or in sealed, tubular sections with or without multiple intake openings or multiple discharge gates at various points.

Advantages claimed for this type of conveyor are: absence of abrasion, the finger-tip rheostat control of the rate of flow, and the ability to handle extremely hot, abrasive materials. When using tubular troughs, dusty materials can be conveyed without charging the atmosphere with dust.

Driving magnets can be placed either below the trough, as illustrated, or above the trough for clearance, and can be either floor mounted or cable-suspended from above.

Making Leather Belts Last Longer

CHICAGO BELTING CO., Chicago, Ill., has issued a bulletin entitled, "Instructions for Maintenance of Leather Belts." Some of the instructions are as follows:

Keep leather belts dressed to prevent their drying out. Dress every three months for ordinary conditions, every month or oftener where air is either dusty or very dry or where the belt is severely overloaded. If you do not keep your belts well dressed they wear unnecessarily. Have your belts made endless. Be sure your belt

is the right size for the load. Be sure you have large enough pulleys, and that your motor is mounted on a pivoted base. Reference is made to the horse-power tables issued by the Engineering Committee of the American Leather Belting Association and the Short Center Leather Belt Drive Data Book.

Gear and Wheel Puller

ARMSTRONG-BRAY & Co., Chicago, Ill., has brought out a line of rigid-arm gear and wheel pullers. This device has many applications in the



Above may be seen the chain-grip puller and below is the steel-grip gear puller

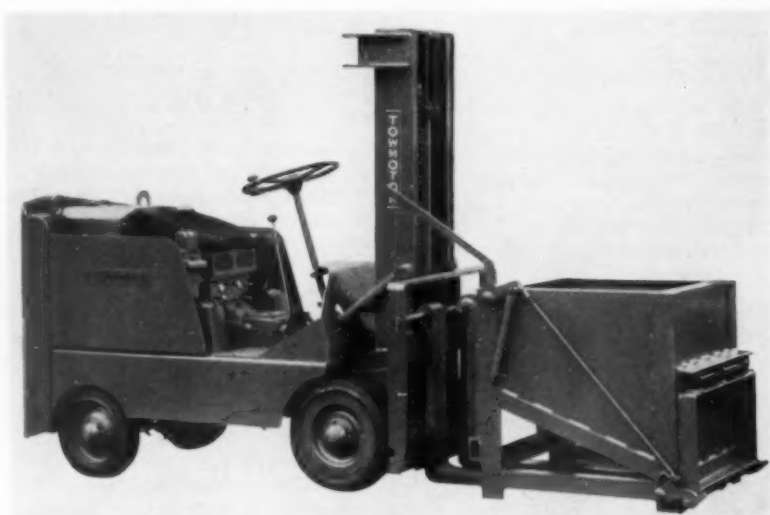
maintenance and repair facilities of shops in the rock products industries. The Steelgrip gear and wheel puller is made with heat-treated forged steel arms and forcing screw, and comes in three sizes. The forcing screw is 12-in. long, handling gears, wheels, etc., up to 12-in. in diameter, and it has an 8-in. reach from the end of the shaft. The other two sizes come with arms having a reach up to 16-in. This company also makes a chain grip puller, shown in the illustration.

Hopper Attachment for Lift Truck

TOWMOTOR Co., Cleveland, Ohio, has developed a hopper attachment to convert its standard lift truck for specialized handling jobs. Designed for use with standard fork equipment, the hopper is available in various sizes. The illustration shows a hopper with a capacity of 17½ cu. ft.

To provide a firm carrying position and permit rapid tilting in dumping hopper loads, the attachment is carried directly on the fork support bar of the lift truck by means of a hook arrangement which is an integral part of the hopper.

The hopper gate is opened for discharge by pulling down a hand lever positioned within easy reach of operator, while quick, complete emptying



Lift truck equipped with hopper attachment for handling bulk materials

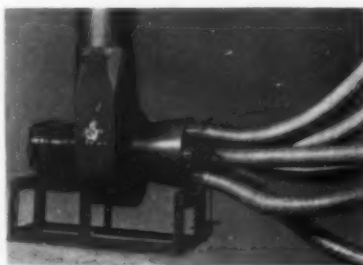
is assured by the slanting hopper bottom. The gate is closed by gravity and is secured by an automatic-catch latch.

This equipment provides an efficient method of handling bulk materials chuted from storage bins or discharged from production machines. As independent units, the hoppers can be placed for filling while the Towmotor is busy on other jobs, then picked up and hurried to the next destination.

Fume Exhauster

CHELSEA FAN & BLOWER Co., Inc., Irvington, N. J., has designed an improved fume exhauster. A feature of this design is said to be that fumes, gases, dust, and grinding compounds do not come in contact with the motor.

The centrifugal type blower wheel is made of ⅝-in. thickness of steel, and it is driven by a 3-hp. ball-bearing motor which has been tested to overload capacity. The framework is welded into a strong unit with handles for convenience in carrying. the fume exhauster.



Portable exhauster for the removal of dust and fumes

Adapters are interchangeable and can be used for suction or blowing as desired.

Plastic for Drills

INDEPENDENT PNEUMATIC TOOL Co., Chicago has designed a ¼-in. portable electric drill in which the grip



Lightweight drill which is made largely of a plastic material

handle, field case and gear case are constructed of a tough, lightweight plastic. This drill was designed to reduce the use of metal to a minimum and to cut down weight.

Handbook on Care of Motors

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., has just published a handbook entitled, "A Guide to Wartime Care of Electric Motors" for free distribution. With motors now subjected to severe operating conditions, the handbook should be of particularly timely value to plant engineers and maintenance men.

Your

HAZARD
LAY-SET
Preformed

**WILL LAST
LONGER ON
PROPER SHEAVES**

Although it is widely acknowledged that **HAZARD LAY-SET PRE-FORMED WIRE ROPE** is easier on sheaves than non-preformed rope, even **LAY-SET** will last still longer and give better service if it operates over the proper size sheave of the correct material.

A sheave that is too small imposes a severe fatiguing effect on the rope, which produces premature fracturing of its wires.

Sheave treads, sheave bearings, and fleet angles should all be watched to protect both rope and sheave life. Wherever possible, sheave diameters should not be less than the values given below:—

for 6x7 construction	.....42 times diam. of rope
for 6x19 Seale construction	.....34 times diam. of rope
for 6x16 Filler Wire construction	}.....30 times diam. of rope
for 6x19 Warrington construction	
for Flattened Strand	
for 6x19 Filler Wire	}.....26 times diam. of rope
for 8x19 Seale construction	
for 6x22 Filler Wire	.....23 times diam. of rope
for 8x19 Warrington	}.....21 times diam. of rope
for 8x19 Filler Wire	
for 6x37 Seale	}.....18 times diam. of rope
for 6x41	

Ask your nearest **HAZARD** man to help you get longer life and better service from your ropes and rope equipment. All **HAZARD** ropes made of Improved Plow Steel are identified by the Green Strand.

HAZARD WIRE ROPE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles,
New York, Philadelphia, Pittsburgh, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.
BRIDGEPORT, CONNECTICUT



HAZARD LAY-SET *Preformed* **WIRE ROPE**

Glass Concern to Operate Sand Plant

OWENS-ILLINOIS GLASS CO. is building a plant on Monterey Peninsula near Lake Majella to provide a source of supply for glass sand. This report from Monterey, Calif., states that the present sand mill is a temporary structure to produce 300 tons daily to meet an emergency. However, it is planned to erect a permanent plant after the war when completely modern machinery can be obtained. The present plant will be equipped for washing and screening operations, and it is expected that magnetic separators also will be installed for the separation of iron from the sand. A pilot plant has been built to separate silica sand from feldspar in the deposits.

Opening New Cement Plant June 1

UNIVERSAL ATLAS PORTLAND CEMENT CO. is planning to shut down its old Northampton cement plant on April 30, and will open its new plant about June 1, if installation of all equipment can be completed by that time. The new plant, said to cost about \$10,000,000, will operate wet instead of dry process. A complete description of the new plant appeared in the December, 1942, issue of ROCK PRODUCTS. Both standard Portland cements and white cement will be made in the new plant.

Ohio Specifications Require Admix

DIRECTOR HAL G. SOURS has announced that the Ohio Highway Department specifications now call for the use of Vinsol resin as an admixture in concrete for highway construction to prevent scaling. The resin will be used in the projected \$3,000,000 Lakeland Freeway, and several other big jobs. It is now being used on a \$1,300,000 bomber plant freeway.

Start Quarry Operations

B. L. ANDERSON Co., Cedar Rapids, Iowa, has received a contract for 40,340 cu. yd. of crushed stone from Cedar County Board of Supervisors. New crusher equipment has been installed in the Ferguson quarry southwest of Mechanicsville.

Ship Sand and Gravel Plant to Job Site

CONCRETE MATERIALS Co., Waterloo, Iowa, has moved its sand and gravel plant from a site near Pratt, Kans., to Forks, Wash., where it



has a large contract to supply aggregates. This company has been engaged in furnishing materials for a large airport.

Glacier Gravel Sold

GLACIER GRAVEL CO., Seattle, Wash., has been sold by J. T. Heffernan, Sr., and associates for a reported consideration of \$1,000,000. A new company headed by Jess Klinker, president of Klinker Sand & Gravel Co., will take over the extensive sand and gravel business and ready mixed concrete operations of the Glacier concern. Five ready mixed concrete plants are operated. Other members of the new firm are Walter DeLong, Anson B. Moody, George J. Schuchart, Jr., Winston D. Brown, Charles Hartman, Howard Wright, George Powell and Robert Evans.

Aggregates Firm to Handle Marine Products

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., has announced that, in addition to its sand and gravel and ready mixed concrete business, it has become a direct factory representative for J. A. Zurn Co., manufacturers of marine product specialties. The sand and gravel company is now an exclusive distributor of Fiberglas in this territory. Alan P. Cline will head the

new department set up for this business. These products are all used by the shipbuilding industry.

Open New Quarry

HILDEBRAND Co. has opened up a new quarry on the Lewis and Clark river, 12 miles east of Astoria, Ore. Arthur Hildebrand will be in charge. This quarry replaces an old quarry property on Sixteenth street in Astoria.

Selling Quarry

ELLISON LIMESTONE PRODUCTS CO., north of Garnett, Kans., has been sold to Brosnahan Brothers and M. J. Donohue of Kansas City, Mo., according to a recent report. Ray Ellison purchased the plant from L. W. Lewis Sons, Emporia, Kans., last August. Charles Dunn will be continued in charge of operations as superintendent, and C. W. Arm-priester will remain as manager. A third secondary crusher was recently installed. Brosnahan Brothers are large paving contractors.

Concrete Contracts

VICTORY SAND & GRAVEL CO., Topeka, Kans. has the subcontract to furnish ready mixed concrete for the Winter General Hospital in Topeka.

CAPITAL CITY CONCRETE PRODUCTS Co., Topeka, Kans., will supply the concrete block.

Cement Consumption Forecast for 1943

DOMESTIC consumption of portland cement in 1943 will amount to 107,788,000 bbl., according to a statement issued by J. L. Haynes, Director, Building Materials Division, W.P.B. In addition to this some cement will be needed for direct military construction outside continental United States and for export to foreign countries. Consumption in 1942 was 177,480,000 bbl.

A tabulation of consumption on figures by districts is given below:

ESTIMATE OF DOMESTIC CONSUMPTION OF CEMENT			
Bur. of Mines Districts (States)	Estimated Domestic Requirements 1943*	% of Total National Requirements 1943	% Actual Increase or Decrease
1—D. C., Del., Md., N. J., East. Pa.	11,165	10.4	—27
2—Conn., Me., Mass., N. H., N. Y., R. I., Vt.	11,210	10.4	—41
3—Ohio, West. Pa., W. Va.	8,635	8.0	—41
4—Mich.	3,545	3.3	—50
5—Ill., Ind., Ky., Wis.	11,110	10.3	—48
6—Ala., Fla., Ga., La., Miss., N. C., S. C., Tenn., Va.	19,680	18.2	—36
7—Ia., Minn., East. Mo., N. D., S. D.	3,720	3.5	—59
8—Ark., Kans., West. Mo., Neb., Okla.	8,070	7.5	—51
9—Texas	5,575	5.2	—51
10—Colo., Ida., Mont., N. Mex., Utah, Wyo.	3,990	3.7	—39
11—Ariz., Calif., Nev.	14,878	13.7	—26
12—Ore., Wash.	6,210	5.8	+ 6
Total	107,788	100.0%	—39%

*Thousands of barrels.

DO YOU NEED INFORMATION?

CATALOGS LISTED ON THESE PAGES WILL HELP SOLVE YOUR PROBLEM

To save the time involved in writing individual letters for this new literature, you may obtain them by merely checking and mailing the coupon on this page.

1 BEARINGS.—SKF Industries, Inc., has published a 32-page manual on the lubrication of ball and roller bearings. The title of the booklet is "A Guide to Better Bearing Lubrication" and illustrates various successful arrangements for oil or grease lubrication and explains the principles involved.

2 BLOCK MACHINE.—Stearns Mfg. Co. has published a 56-page Service Manual, generously illustrated with mechanical drawings, explaining in detail every step in the installation of the Model 7 Joltcrete block machine and covering every possible service demand that may develop in the operating life of the machine.

3 BREAKERS.—Roller-Smith Co. new 12-page Catalog 3350 describes and illustrates 15,000 volt oil circuit breakers for indoor service, classes 150-TCR-3, which are available in 600 and 1200 ampere capacities, and 250-TCR-3, which can be furnished in 600, 1200 and 2000 ampere ratings. The catalog lists the various sizes of breakers with their interrupting ratings, closing and tripping currents, amount of oil required and approximate shipping weights. Control diagrams, methods of tripping and dimensional data also are given.

4 BUCKETS.—Robins Conveying Belt Co. has issued Bulletin No. 121 describing and illustrating 4-ton, 10-ton and 12-ton grab buckets. Rope system and man trolley bridges, Types R and C towers, car dumpers, etc. are also included in the bulletin.

5 CATALYST RECOVERY.—Western Precipitation Corp. has compiled a new booklet for engineers, executives and technical men interested in catalytic refining processes in modern aviation gasoline and synthetic rubber production. In it are discussed the important phases of catalyst recovery, the types of equipment best suited to each phase, and their methods of operation.

6 CONVEYORS.—Diamond Iron Works, Inc., new Equipment Bulletin No. D-42-E describes and illustrates Models LC-100, LC-150, LC-200, LC-300 and LC-350 belt conveyors, and Models NL and TR conveyor rolls, also bucket elevators.

7 CONTROLLERS.—Wheelco Instruments Co., in Vol. 2, No. 2 of "Wheelco Comments" describes and illustrates controllers for temperature control applications. Also described are pyrometers, potentiometers and thermometers with unit construction features that permit ready removal of each component for inspection, repair and replacement without removing the instrument from service. Design features that permit convenient conversion of one model to another, such as a pyrometer to a potentiometer, are included.

8 CONTROLLERS.—Leeds & Northrup Co. has released a new 29-page Catalog No. N00A, describing and illustrating the Micromax electric control for furnace, heating unit or chemical process. The unit consists of a Micromax controller, M.E.C. control unit and a valve drive mechanism. The catalog also in-

cludes descriptions and illustrations of Models S, R and C Micromax electric indicating and recording controllers.

9 CONTROLLERS.—The Bristol Co. has published an 8-page bulletin, No. A112, describing new convertible free-vane air-operated controllers recently developed. Data is given on the five types of controllers along with information on converting from one type to another.

10 COMPRESSORS.—Allis-Chalmers Mfg. Co., has issued Bulletin B-6211 describing and illustrating Ro-Flo compressors and pumps which operate at 1200 or 1800 r.p.m. A complete engineering description is supplemented by installation diagrams, curves showing the relationship between pressure, temperature, and volume, photographs, and section views.

11 CRUSHERS.—Diamond Iron Works, Inc., new Equipment Bulletin D43D gives full details, illustrations and sizes of all Diamond jaw crushers.

12 CRUSHING AND SCREENING PLANT.—Iowa Mfg. Co. has published Bulletin No. MT-1, describing and illustrating the new style Master Tandem portable crushing and screening plant for gravel or rock. This plant uses Universal shaft drives and "V" belt drives; no sprockets or chains are required.

13 CUTOOTS.—General Electric Co. has published Bulletin GEA-3904, which is a supplement to bulletin GEA-732-H, describing and illustrating oil fuse cutouts, Type D&W. The new metal-enclosed assemblies are available for single- or three-phase applications and are said to be particularly adapted for use in industrial plants (indoors or outdoors) to provide economical short-circuit protection and switching of feeder and branch circuits, individual transformers or banks, motors and control apparatus.

and electric-heating and other types of equipment.

14 DIESELS.—Caterpillar Tractor Co. has released a new 8-page booklet D-267, entitled "How are 'Caterpillar' Diesels Serving and Saving?" Interesting sketches and photographs are used to illustrate the series of questions and answers.

15 DRIVES.—American Pulley Co. new 36-page Econ-O-Matic Drives catalog ED-42 contains blue-prints, drive selection tables and dimension tables. It deals with both V-belt and flat-belt drives, and includes data on motor base mountings for special applications. Photographs and case histories of typical power-transmission installations are featured.

16 DRIVES.—Allis-Chalmers Mfg. Co. has published a new bulletin, B-6051-C, simplifying the problem of selecting correct V-belt drives for wartime applications. List prices, stock sizes, dimensions and construction details are included for all Texrope drives. Additional descriptions cover the application of Texrope Vari-Pitch sheaves and drives and Vari-Pitch speed-changer.

17 DRYERS.—Hardinge Co., Inc., has published a 36-page bulletin, No. 16-C, which discusses the fundamentals and various methods of drying the many classes of raw materials. It describes in detail the construction, application and operation of rotary dryers, double shell direct and indirect heat dryers, rotary steam tube dryers, single shell direct heat dryers, parallel flow direct dryers and the single shell hot air dryers.

18 JAW CRUSHERS.—Diamond Iron Works, Inc., has released Bulletin D-41-D describing and illustrating various sizes of jaw crushers. Capacities, dimensions and specifications are also given.

Cut Out and Mail This Coupon to

ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago, Ill.

(5-43)

I would like to have the items circled.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48						

Name (Position)
 Company
 Street
 City & State

NEW LITERATURE

- 19 **LOCOMOTIVES.**—Westinghouse Electric & Mfg. Co. new 33-page booklet No. B-3150, entitled "Time Saver" is designed to aid in extending the life of mine locomotives and covers operating tips; trouble checks; inspection reports; inspection charts, and a lubrication chart for typical mine locomotives.
- 20 **MASONRY PAINT.**—Colorthru Chemicals has issued a circular describing and illustrating a new product that is a finish coat in color for masonry, known as "Colorthru." It can be used inside or outside, on damp or dry, painted or unpainted masonry, and claims to penetrate, waterproof and preserve floors or walls of concrete, brick, stucco, cement, asbestos, stone, mortar, masonry and plaster.
- 21 **MOTORS.**—Allis-Chalmers Mfg. Co. has issued a new bulletin, B-6052-C, designed to give all the facts necessary for quickly choosing correct motors for wartime applications. Simplified charts permit the reader to determine electrical and mechanical characteristics of the motor types designed for the application in which he is interested. Rating, duty, torques, starting current, efficiency and slip are indicated, for squirrel-cage, wound rotor, direct-current and synchronous motors. In addition, construction features of various LO-Maintenance motors are completely described and numerous typical applications are illustrated.
- 22 **PUMPS.**—Allis-Chalmers Mfg. Co. has released a maintenance manual, B-6256, entitled "Handbook for Wartime Care of Centrifugal Pumps," which includes valuable wartime tips, such as how a change in liquid can blitz a pump, easy ways to find leaks, common mistakes in packing stuffing boxes, and many others. It gives a step by step picture of a centrifugal pump being built and shows how each part is added and should be cared for.
- 23 **PUMPS.**—Chain Belt Co. has released a new catalog, Bulletin No. 404, descriptive of the 1942 models of the REX pump. Technical data concerning how to operate and set up the pump is included in the catalog, also complete specifications and dimensions for all of the various size machines.
- 24 **PYROMETERS.**—Leeds & Northrup Co. has brought out a 56-page Catalog N-33A, illustrating and describing Micro-max Thermocouple Pyrometers for measurement and control. The catalog is well-illustrated and gives first-hand information about available instruments—indicators, recorders and controllers—and about the thermocouples and accessories which are used with them.
- 25 **PULVERIZER.**—Bradley Pulverizer Co. has issued Catalog 58 describing and illustrating Type "B" Junior Hercules mill, which takes rock $\frac{3}{4}$ - to 1-in. and under and is particularly adapted to the agricultural limestone and fertilizer industry. Specifications, weights and a sectional view of the pulverizer are also given.
- 26 **REPAIR PARTS.**—Link-Belt Co. has issued a new 180-page illustrated General Catalog No. 850 of standard equipment. Dimensions, weights, list prices, and other data are given on chains, sprockets, silent and roller chain drives, bearings, baseplates, takeups, shafting, couplings, collars, clutches, pulleys, gears, buckets, conveyor idlers, screw conveyor, car spotters, speed reducers, etc.
- 27 **ROLL CRUSHERS.**—Diamond Iron Works, Inc., has issued Bulletin D-42C illustrating and describing roll crushers. Specifications, dimensions and cross-section diagrams are also shown.
- 28 **RUBBER.**—Pioneer Rubber Mills has issued a booklet entitled "How to Lengthen the Life of Mechanical Rubber Goods" which contains many good ideas and timely suggestions on the care and maintenance of rubber belting and hose.
- 29 **RUBBER LINING.**—B. F. Goodrich Co. has issued a 4-page Catalog Section No. 9000, describing the Vulcalock process which is used to bond rubber integrally to steel with an adhesion exceeding 500 lb. per sq. in.
- 30 **RUBBER TRACKS.**—The B. F. Goodrich Co. has published an eight-page booklet, plentifully illustrated and with a large amount of data on band and block rubber tracks for vehicles.
- 31 **SHOVELS.**—Lima Locomotive Works, Inc., has issued an interesting booklet entitled "Timely Tips" which contains useful information pertaining to the servicing and operation of shovels, draglines and cranes.
- 32 **SPROCKET WHEELS.**—Link-Belt Co. has released a new 8-page illustrated Book No. 2067 listing sizes of cast tooth sprocket wheels for Ewart detachable "H" Class, SM, SS, XS, GL, "C" Class and "800" Class chains. List prices, dimensions, weights, are given in the folder.
- 33 **SPEED REDUCERS.**—Winfield H. Smith, Inc., has released two bulletins entitled "Torque versus Horsepower" and "Overhung Loads on Speed Reducer Shafts" which materially aid the solving of speed reducer problems. Both bulletins are written in non-technical language, are well illustrated and cover the subjects very completely.
- 34 **SWITCHGEARS.**—Roller-Smith Co. has released Catalog No. 1110 describing and illustrating metal-clad switchgears in 100,000, 150,000 and 250,000 KVA capacities at 5000 and 15,000 volts. Complete dimensional data on the various types of gear available, also is included.
- 35 **SCREENS.**—Allis-Chalmers Mfg. Co. bulletin B6151A describes and illustrates the new Ripl-Flo vibrating screen.
- 36 **SCREENS.**—Diamond Iron Works, Inc., 8-page bulletin D-41-F contains illustrations and descriptions of rotary scalping and scrubber screens, combination scrubber screens, shaker screens and drag washers.
- 37 **SCREENS.**—Robins Conveying Belt Co. has issued a new bulletin, No. 122, describing and illustrating Styles M and J Vibrex vibrating screens. Construction features and dimensions of these and the contractor's screen are shown.
- 38 **SCREENS.**—Diamond Iron Works, Inc., has released Bulletin D-41-B describing and illustrating triple-deck vibrator screens, both the Mogul type and the type suspended by cables.
- 39 **SHOVELS.**—Link-Belt Speeder Corp. has issued a new 12-page catalog No. 1943, describing and illustrating $1\frac{1}{4}$ -yd. heavy-duty model LS-120 crawler shovel, crane, dragline. Of particular interest to contractors should be the information given on the LS-120 pull shovel. The front-end attachment of this unit is of completely new design and permits deeper and more positive digging than before. The book shows both construction details and installation views. General dimensions, clearances, lifting capacities, specifications are also given.
- 40 **STEEL PARTS.**—American Manganese Steel Division of American Brake Shoe & Foundry Co. has released Bulletin No. 642-C, containing information and illustrations on crusher, grinding mill and pulverizer parts.
- 41 **THERMOMETERS.**—The Bristol Co. has issued Bulletin T-302, illustrating and describing Model 140M fully-compensated liquid-filled recording thermometer for temperature ranges between -125° F. and $+400^{\circ}$ F., with tubing lengths up to 200 ft.
- 42 **TRANSFORMERS.**—Allis-Chalmers Mfg. Co. new Bulletin B-6186 describes and illustrates power and distribution transformers. The new electro-cooler for increasing transformer capacity, and unit substations which simplify power control and distribution are two new developments treated in the bulletin. Others included are feeder voltage regulators, instrument and metering transformers, etc.
- 43 **TURBINES.**—General Electric Co. has released Bulletin GEA-1145D describing and illustrating Types D, DS-114, DS-120 and DS-125 mechanical-drive turbines. Specifications and sectional views of the turbines are also given.
- 44 **TRACTORS.**—Allis-Chalmers Mfg. Co. has issued a booklet entitled "Fighting Power" which describes and illustrates the important part tractors, farm machinery, and road machinery play in providing the material and machines for Victory.
- 45 **V-BELTS.**—Allis-Chalmers Manufacturing Co. has published a new handbook—"Plain Facts on Wartime Care of Rubber V-belts" which gives helpful information on the care and maintenance of all makes of V-belts.
- 46 **VULCANIZERS.**—The B. F. Goodrich Co. has brought out a four-page catalog section No. 2158 on belt vulcanizers. It gives all pertinent details on the type of construction, dimensions, capacity, and type of current necessary to operate them. The catalog also describes splicing tools used with the vulcanizers and splicing materials.
- 47 **WELDERS SAFETY CLOTHING.**—General Electric Co. has issued a new bulletin, GEA-3295, which gives complete details and specifications of safety clothing designed especially for women welding operators.
- 48 **WELDING.**—General Electric Co. has issued an attractive new 32-page bulletin (GEA-2704-B), entitled "Arc-welding Accessories," profusely illustrated throughout, presenting a complete line of arc-welding accessories. Among items listed are goggles, observation shields, ventilated head protectors, chrome-leather protective clothing, flame-proofed welding screens, ultraviolet-ray protective paint, metal and carbon electrode holders, clamps, cable connectors, brushes, chippers, electrode carriers, and fillet-weld gauges. Also listed is the 200-page arc-welding manual.

Liming Material Sales in Ohio

OHIO SALES of all liming materials in 1942 totaled 1,420,059 tons, according to a statement issued by Earl Jones, extension agronomist, Ohio State University. Of this total, 36,266 tons, represented finely pulverized limestone or precipitated carbonate products; 254,123 tons, ground limestone; 1,097,290 tons, limestone meal; 11,058 tons hydrated lime, and 21,322 tons agricultural slag, screenings, sugar beet lime, marl and unclassified.

Lime Meeting

NATIONAL LIME ASSOCIATION has announced that a special open meeting of the Board to which interested members are invited will take the place of the annual convention. The meeting, originally scheduled for May 17 and 18, will be held May 10 and 11 at The Homestead, Hot Springs, Va. This change in date was made necessary as the original date conflicted with the International Food Conference.

Sand-Lime Brick Production and Shipments

SEVEN active sand-lime block and brick plants reported for March and four for February, statistics for which were published in April, 1943.

AVERAGE PRICE FOR MARCH

	Plant Delivered Price	Price
Detroit, Mich.		\$16.00
Saginaw, Mich.	\$13.00	
Grand Rapids, Mich.		15.00
Flint, Mich.		
Seattle, Wash.	16.50	18.50
Madison, Wis.	14.00	15.00
Boston, Mass.		

STATISTICS FOR FEBRUARY AND MARCH

	*Feb.	**March
Production	726,000	631,000
Shipments (rail) ...	25,000	20,000
Shipments (truck) ..	532,400	1,389,690
Stock on Hand.	709,880	519,930
Unfilled Orders	2,550,000	1,535,000

*Four plants reporting, incomplete, two not reporting unfilled orders.

**Seven plants reporting, incomplete, two not reporting stock on hand and five not reporting unfilled orders.

Pavement Yardage

AWARDS of concrete pavement for March, 1943, have been announced by the Portland Cement Association as follows:

	Square Yards Awarded During March, 1943
Roads	926,897
Streets and Alleys	849,596
Airports	5,465,526
Total	7,242,019

NATIONAL GYPSUM CO., Buffalo, N. Y., reports the discovery of a new oil pool on its Sun City, Kans., properties.

A Little Metal Saves a Lot—the Amsco Way

Current uses of Amsco welding products present numerous instances where substantial quantities of critical metals have been saved, and important monetary savings effected at the same time.

A Pennsylvania quarry fore-stalled rapid wear of its gyratory crusher concaves by hard-surfacing them with 1/4" Amsco Economy Hardface welding rod. This self-hardening rod is highly resistant to both impact and abrasion—much more so than the parent metal in this instance—and deposits with a Brinell hardness of 450 to 550.

The service life of the segments, one of which is shown in View A-234, was greatly increased. The cost of the hard-surfacing was much less than the

frequent purchase of new and hard-to-get castings. Such applications permit the use of the more readily available metals, reducing consumption of scarce materials.

For obtaining additional service from badly worn equipment parts, such as bucket teeth, tractor grousers, dipper fronts and cutter head blades and teeth, Amsco cast repointer bars or rolled special shapes have proved effective. After using Amsco Nickel-Manganese Steel welding rod to weld on the repointer bar and fill the voids, one of the Amsco hard-facing welding rods can be applied. The dipper teeth shown in View A-235 were salvaged by repointing and hard-facing by a Canadian job welding shop—a little metal used to save a lot.

These times demand the application, where possible, of rebuilding and hard-facing to insure maximum service life from ferrous equipment parts subjected to abrasive or frictional wear.

Write for Bulletin 941-W on Amsco Welding Products.



Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

THE AMERICAN

Brake Shoe

AND FOUNDRY COMPANY



FINANCIAL NOTES

RECENT DIVIDENDS

Canada Crushed Stone, Ltd.	.10	June 15
Medusa Portland Cement Co. Com. (np)	.25	April 8
National Gypsum Co. \$4.50 pfd.	1.12½	June 1
Pacific Portland Cement Co. 6½ pfd. (pi00) (ar-rears)	1.00	April 29
Riverside Cement Co. 1st pfd.	1.50	May 1
Superior Portland Cement, Inc., Cl. B.	.50	May 1
Schumacher Wall Board Corp.	\$0.20	May 15
Schumacher Wall Board Corp. pfd.	.50	May 15

YOSEMITE PORTLAND CEMENT CO., San Francisco, Calif., reports a record profit of \$186,091 for the calendar year 1942, after all charges, which compares with \$124,992 earned in 1941.

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., reported a net income of \$609,937 for the year ended December 31, 1942, after all charges. This compares with a net income of \$746,937 for 1941. Net sales in 1942 were \$4,560,829 as against \$4,005,969 in 1941.

BESSEMER LIMESTONE & CEMENT CO., Youngstown, Ohio, announced a net income of \$157,162 for the year ended December 31, 1942, as compared with a net income of \$188,638 for 1941. Net sales were \$2,265,370 in 1942 as against \$1,745,530 in 1941.

AMERICAN AGGREGATES CORPORATION, Greenville, Ohio, reported the following income account for the years ended December 31:

	1942	1941
Net sales	\$3,308,478	\$2,589,433
Cost of sales	1,955,800	1,573,142
Selling, etc., expense	281,885	219,420
Deprec. & deplet.	252,793	222,634
Operating profit	818,200	574,237
Allied oper. inc.	170,487	132,689
Other income	123,926	118,874
Total income	1,112,613	825,800
Interest	17,998	14,079
Other deductions	*302,084	4,796
Fed. income tax	521,000	493,137
Net income	271,551	313,788
Preferred divs.	57,750	57,750
Common divs.	93,763	
Surplus for year	120,038	256,038
Earn. surp., 1-1	569,176	313,137
Fed. inc. tax res.	cr 100,000	
Earn. surp., 12-31	789,214	569,176
Earn., pfd. share	\$23.51	\$27.17
Earn., com. share	1.14	1.36
No. of pfd. shares	11,550	11,550
No. of com. shares	187,626	187,626

*Amortization of emergency facilities, loss on sale of permanent assets, etc.

MONOLITH PORTLAND CEMENT CO., Los Angeles, Calif., had a net profit of \$180,716 for the year ended December 31, 1942. This compares with \$235,022 in 1941.

NAZARETH CEMENT CO., Nazareth, Penn., had a net profit of \$89,492 for the year ended December 31, 1942, as compared with a net profit of \$270,532 in 1941.

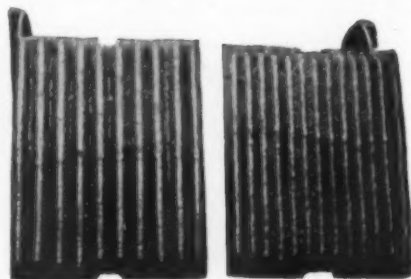
LONE STAR CEMENT CORPORATION, New York, N. Y., reported the following income account for the years ended December 31:

	1942	1941
Sales	\$34,918,772	\$30,779,087
Mfg., etc., expense	19,058,837	16,553,518
Selling, etc., exp.	3,003,169	3,055,404
Depreciation and depletion	2,259,981	2,455,462
General taxes	756,670	585,255
Operating profit	9,840,115	8,125,448
Other income	359,625	394,338
Total income	10,199,740	8,523,786
Serv. annuities	439,728	408,118
Misc. charges	286,932	289,297
Incomes taxes	1,713,049	1,794,001
Excess prof. tax	4,760,000	1,915,000
Post-war tax cred.	cr 476,000	
Fgn. exch. adj.	32,693	12,835
Net income	3,443,339	4,104,535
Common divs.	3,082,940	3,794,388
Surplus for year	360,399	310,147
Earn. surp., 1-1	11,285,723	10,801,000
Fgn. exch. adj.	cr 265	cr 213,995
*Debits	42,457	39,419
Earn. surp., 12-31	11,603,930	11,285,723

*Amount transferred to statutory surplus of subsidiaries in Argentina and Brazil.

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WHERE FORMERLY
1800 TONS HAD
BEEN THE LIMIT!



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Coast Metals Hard-Facing is of particular value wherever it is difficult or impossible to get new parts, or replace those which are worn out

because of the heavier load and longer periods of service to which equipment today may be subjected.

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hard-facing
weld rods

YOUR EQUIPMENT'S LIFE PRESERVER AGAINST WEAR

WOLVERINE PORTLAND CEMENT CO., Coldwater, Mich., reported a net profit of \$42,833, after all charges, for the year ended December 31, 1942. This compares with \$40,112 for 1941.

CONSOLIDATED CEMENT CORPORATION, Chicago, Ill., has announced the following income account statement for the years ended December 31:

	1942	1941
Net sales	\$3,291,199	\$2,533,770
Cost of sales	2,179,981	1,846,194
Selling, etc., exp.	467,879	480,613
Idle prop. exp.		5,572
Operating profit	643,338	201,391
Other income, net.	12,559	6,405
Total income	655,898	207,796
Bond & note int.	72,051	83,017
Discount & expense	7,150	6,887
Income taxes	243,000	31,500
Net profit	333,697	86,392
Class A divs.	173,295	73,570
Surplus for year.	160,402	12,822
Earn. surp., 1-1.	301,569	290,038
Adjust. (net)	1,400	1,291
Earn. surp., 12-31.	460,571	301,569
Times chg. earn.	8.28	2.31
Earn., cl. A share.	\$3.34	\$0.86
No. of cl. A shs.	99,916	100,513

¹ Includes mill overhead applicable to non-operating periods: 1942, \$80,507; 1941, \$114,477.

² After depreciation and depletion: 1942, \$200,195; 1941, \$188,003.

³ Before income taxes.

⁴ No excess profits taxes payable.

MONOLITH PORTLAND CEMENT CO., Los Angeles, Calif., had a net profit of \$180,716 for the year ended December 31, 1942. This compares with \$235,022 in 1941.

WARNER Co., Philadelphia, Penn., had the following consolidated income account for the years ended December 31:

	1942	1941
Net sales	\$10,313,935	\$9,676,570
Cost of sales	7,231,535	6,563,225
Depreciation and depletion	386,722	334,271
Selling expense	282,749	279,089
Admin. expense	377,052	271,045
Operating profit.	2,035,877	2,228,940
Secur. income	36,654	44,052
Total income	2,072,531	2,272,992
Inc. chgs. net.	104,488	230,462
Balance	1,968,043	2,042,531
Bond int., etc.	291,264	316,746
Bond disc. & exp.	32,079	33,863
Income taxes	651,200	437,000
Excess prof. tax.	22,000	
Debt retire. cred.	cr 2,200	
Prov. for conting.	90,000	75,000
Net profit	883,701	1,179,922
Earn. surp., 1-1.	543,317	d 558,854
Credits	*206,808	82,424
Debits	129,191	160,175
Earn. surp., 12-31.	1,504,636	543,317
Times chg. earn.	5.81	5.61
Earn., 1st pfd. sh.	\$34.20	\$45.66
Earn., 2nd pfd. sh.	14.83	20.36
Earn., com. sh.	3.95	5.62
No. 1st pfd. shs.	25,841	25,841
No. 2nd pfd. shs.	53,500	53,500
No. of com. shs.	177,192	177,192

*Includes \$32,263 undistributed earnings of Kings Farms Co. during period of partial ownership acquired on acquisition of entire ownership and dissolution of such company.

¹ Before income taxes.

² Disregarding preferred arrears.

³ Includes \$98,214 loss on liquidation of Warner Organization Securities Co.

MEDUSA PORTLAND CEMENT CO. showed the following consolidated income account for the years ended December 31:

	1942	1941
Net sales	\$7,661,254	\$7,675,000
Cost of sales	4,909,026	4,740,993
Selling, etc., expense	1,106,043	1,243,724
Depreciation and depletion	683,760	691,793
Operating profit.	962,426	998,489
Other income	12,606	31,752
Total income	975,032	1,030,241
Interest	17,246	20,908
Other deductions.	60,107	12,416
Income taxes	356,762	294,294
Excess prof. tax.	5,490	60,300
Net profit	535,426	642,323
Preferred divs.	16,667	17,147
Common divs.	265,465	398,624
Surplus for year.	253,284	226,552

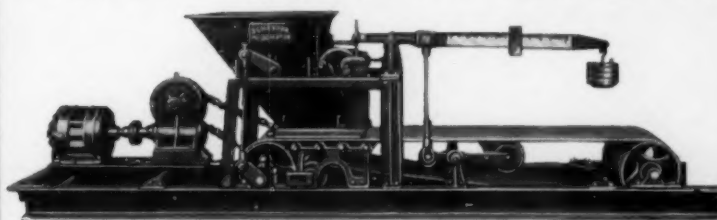
Surplus, Jan. 1.	3,032,626	2,806,220
Debits	24	148
Surplus, Dec. 31.	3,285,886	3,032,626
Earn., pfd. share.	\$192.67	\$228.99
Earn., com. share.	2.93	3.53
No. of pfd. shares.	2,779	2,805
No. of com. shares.	176,887	177,166

Notes: (a) Operations of Canadian subsidiary consolidated above, resulted in a net profit of \$4,798 (1941, \$3,633).

(b) Company is subject to possible renegotiation of war contracts.

GYPSUM, LIME & ALABASTINE, CANADA, LTD., Paris, Ont., Canada, had a net profit of \$263,754 for the year ended November 30, 1942, which compares with a net income of \$233,318 for the year ended November 30, 1941.

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Cement Production Dropping Off

BUREAU OF MINES reports that during February, 1943, production declined five percent from February, 1942. The long-term trend in production, shown by the "Moving 12-Months Total" curve on the chart, was downward for the first time since the middle of 1940. However, operating activity in February remained at a high rate with production more than $1\frac{1}{2}$ times greater than the average February output during the 1935-39 period.

Shipments of finished cement were 4 percent above those in February, 1942, and the total for the calendar year to date was only slightly lower than shipments in the similar period of 1942. Shipments were up sharply over the same month last year in all of the Southern States except Alabama, Arkansas and Virginia. In the

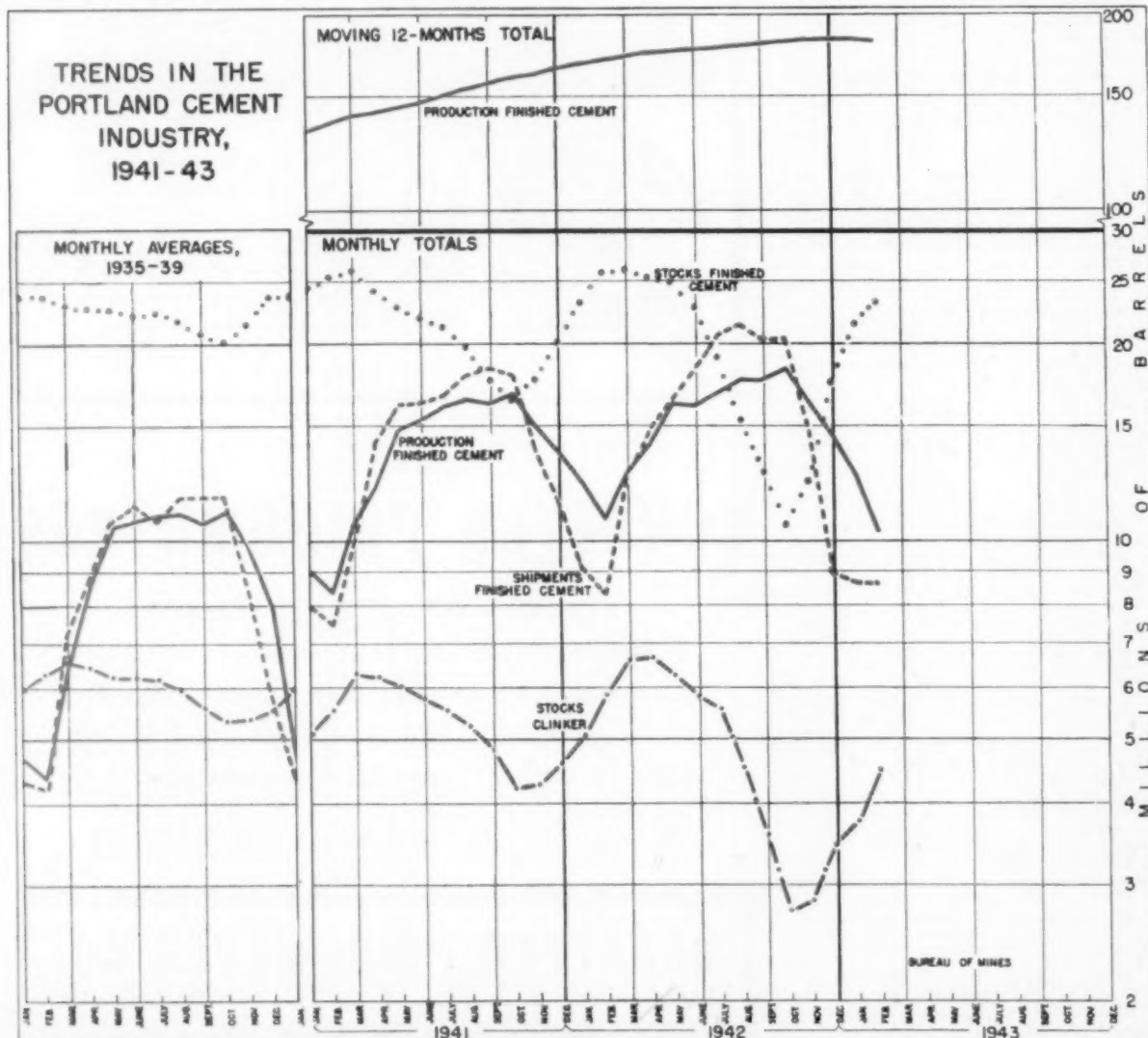
Middle West, demand for cement increased markedly in Kansas, Nebraska and Oklahoma and was greater than in February, 1942, in Illinois, Indiana, Missouri and Ohio. Declines were noted in all other Middle Western States. Consumption of cement increased in all Rocky Mountain States except Montana and Idaho: Utah showed the greatest proportional gain, 469 percent over February, 1942. On the Pacific Coast, overall demand was slightly lower than in February, 1942, although increased shipments in Oregon and Washington compensated for part of the decline in shipments in, within and to California. Indicated consumption was off sharply from February, 1942, in all the New England and Middle Atlantic States except four which are relatively small consumers of cement.

Stocks of finished cement at mills on February 28, 1943, were 10 percent below those of the same date last year; however, they were 8 percent above stocks on January 31, 1943, and were at what might be termed a normal level.

Production of finished cement in February, 1943, totalled 10,293,000 bbl., shipments amounted to 8,656,000 bbl., and stocks were 23,005,000 bbl. The figures cover companies in the United States and Puerto Rico.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of February, 1943 and of February, 1942:

	RATIO (PERCENT) OF PRODUCTION TO CAPACITY				
	February 1942	January 1943	December 1942	November 1942	October 1942
The Month	57.0	54.0	60.0	67.0	80.0
12 Months	69.0	74.0	74.0	74.0	74.0



Length of Haul Tests of Ready Mixed Concrete

(Continued from page 80)

evaporation during sampling.

The average amount of water added was 14 percent and the average decrease in strength was 10 percent. That additional water would be expected, from normal water-ratio-strength relations, to reduce the strength about 24 percent. Further it will be observed, that the average total reduction in strength from the sample with "no haul" to the retempered sample after an average haul of about 5 hours was only 13 percent. These relationships are brought out in better detail in Fig. 4.

Conclusions

The following conclusions appear to be justified by these tests for ready-mixed concrete made with a normal portland cement and stream-wet sand and gravel aggregates of the nature of those available in the Ohio River at Louisville, and transported in a standard truck mixer with drum revolving at 4 r.p.m.

1. Lengths of haul within normal specification limits results in no reduction in strength; generally a slight increase occurs.

2. Excessive lengths of haul, continued until the concrete is quite stiff, results in strength losses generally less than 10 percent.

3. Concrete having a slump of 4 to 5 in. immediately after mixing is decreased in slump by a 90-minute haul in an agitator, about 1½ in. when the concrete temperature is about 60 deg. F. and 2½ in. when the concrete temperature is in the neighborhood of 80 deg. F.

4. A good relationship exists between loss in slump and a "degree-hours" factor for the concrete, "degree-hours" being the average temperature of the concrete multiplied by the length of haul in hours.

5. The amount of grinding is negligible for normal lengths of haul.

6. Retempering concrete to restore lost slump appears to reduce the strength only about one half as much as would be predicted from a normal water-ratio-strength relationship.

Billion Dollar Highway Post-War Program

PRODUCERS in the rock products industries who are alert to future demands on their plant capacity should lay plans to be ready for the billion-dollar highway program outlined in the McKellar-Robinson bill now be-

fore the House and Senate road committees. The bill would authorize contribution of this sum to the various States for urban and rural highways during the first three years after the war.

W.L.B. Denies Wage Increase to Employees

EMPLOYEES of the Universal-Atlas Cement Co., Universal, Penn., plant were denied an increase of 5½c an hour by the War Labor Board to bring the rates into line with two other plants of the company and with the pattern of steel wages which they have followed since 1937. The board

instead only allowed 2c which was conceded permissible under the 15 percent "Little Steel" formula. This decision was in the nature of a test case implementing President Roosevelt's executive order of April 8, 1943, which denied any further increases in wages, other than adjustments for an increase in the cost of living as provided in the "Little Steel" formula.

Stone Merger

BRYAN-MONROE CO., Raleigh, N. C., has taken over the Lillington Stone Co., Lillington, N. C. N. C. Farrell is the plant superintendent.



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Chemist Corner

(Continued from page 66)

designer will arrange for other than carefully built, rugged equipment.

The method of investigation described above indicates the weight to be taken at any size if there is only one stage of sampling; but, the more stages there are the greater are the chances of error. The net effect of this is to require that weights indicated by the derived formula must be multiplied by the number of stages. For example, a four-stage lay-out requires four times as much ore to be taken at any size as is shown by the basic formula. Because of increasing costs it is best to use the fewest possible number of stages; but with original material as coarse as 3-in. the number cannot, usually, be made less than four. In determining the number, those in the bucking room (where the final pulp is prepared for the laboratory) must be counted.

The superintendent should never permit careless operation. There is one important matter that needs daily checking—the size of coarsest particles at each crushing and grinding stage. If 0.50-in. is one of the intended sizes, it will often become 0.60-in. unless frequent screen tests are made and the crusher adjusted accordingly. Mere visual estimate, without actual screen tests, are not dependable. Increasing from 0.50-in. to 0.60-in. will usually call for at least 50 percent greater weight; but the mechanical cutter cannot respond to this increased demand; it can take only the quantity for which it was designed. Again: when the pulp fineness for the laboratory has been settled, it must be maintained by screen test on every sample. For some superintendents such cautions are superfluous; yet there are too many cases where operators see no reason for being "so over-particular," but where thorough checking leads to greatly improved sampling. It some-

times happens that, although this kind of care is exercised at the point where failure can most easily be detected, namely in the final laboratory pulp, yet there is neglect about checking the coarse sizes. On the other hand, it has happened, in sampling mills where the design made it easy to keep to the specified sizes at the coarse stages, that carelessness was overlooked as to the final pulp.

In various instances, where the value of our methods for accurate sampling were not understood, most of the factors noticed in this section have been ignored.

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New Incorporations

The Cement Tile Corp., Chicago, Ill., has been incorporated to manufacture concrete roofing tiles, with a capital of 396 shares of preferred stock, par value \$100 a share, and 900 shares, par value \$1 a share. Incorporators are A. Nelson, A. R. Brons, and S. E. Hirsch. Correspondent is Wilhartz & Hirsch, 1501 First National Bank Bldg., Chicago.

The Advance Cement Process Corp., New York, N. Y., has been organized to deal in building materials of all kinds. Capital stock, 100 shares, no par value. L. T. Fetzer, 15 Williams St., New York City, is the incorporator.

General Minerals Corp., Shelby, N. C., has received certificate of incorporation to operate all kinds of mines. Authorized capital stock \$5,000, subscribed stock \$2,000. Incorporators are Henry P. Lammerts, H. K. Lammerts and Robert E. Kemerer, all of Shelby.

Meriden Washed Sand and Stone Co., Inc., South Meriden, Conn., has been incorporated with a capital of 10 shares of stock at \$100 par value. Officers are Douglas T. Johnson, Meriden, president; William J. Smith, New Haven, vice-president; George J. Smith, Derby, secretary and treasurer.

Ridgeway Mica Co., Greensboro, N. C., has been incorporated. C. R. McIver, 423 Tate St., Greensboro, is the agent.

Yakima Sand, Gravel & Crushed Rock Co., is the name of a new organization in Yakima, Wash. Incorporators are W. P. Hews, J. R. Sherman and W. F. Padlock. D. V. and Lane Mortland, 523 Miller Bldg., Yakima, filed the incorporation papers.




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Washington Doings and Regulations

THERE are various evidences of a slowing up of construction activity and the intent of government authorities to take all possible advantage of it. As described on the editorial page, plans for establishment of nucleus plants are in the air; both the Army and Navy are making strenuous effort to recruit men of construction experience, priorities for many firms in these industries are being tightened.

Priorities

CMPL-132: W.P.B., Mining Equipment Division, has straightened out the priority situation for holders of Mine Serial Numbers under P-56. These may now ask for their quarterly quotas with AA-1 priority ratings. Operators without serial numbers may still apply for them; without them the best priority they can get is A-2. In addition to the allotment of controlled materials for purchase and delivery in the second quarter, orders may be placed for delivery of controlled materials in the third quarter up to 80 percent of the amount of the second quarter con-

trolled material allotment, and also for delivery in the fourth quarter of 1943 and the first quarter of 1944 up to 60 percent and 40 percent respectively of the same allotment. Deliveries to be scheduled for advance quarters must be indicated in the allotment number by the proper figures for the month, as 19 for July, 22 for October, 25 for January, etc. Records must be kept of the orders placed against these advance allotments, as well as those placed for delivery in the second quarter, so as not to exceed the percentage allowed. Deductions from the allotment should be made at the time the order is accepted for delivery and should be charged against the period specified by the allotment number.

Limestone for Sugar Industry

O.P.A. Order 248 under M.P.R. 188: Following maximum prices are established for limestone (kiln size) for the beet sugar industry in Colorado, Wyoming, Montana, Utah and Idaho:

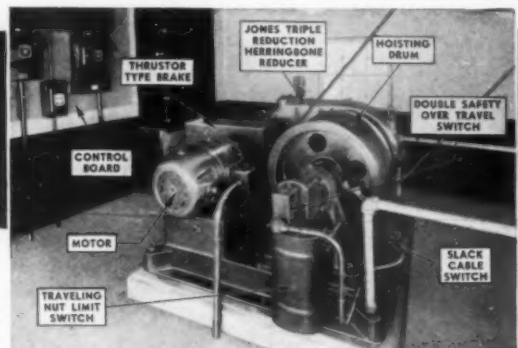
W. P. Enders, Basin, Wyo., 97 per-

For Economical Material Handling JONES SKIP HOIST DRIVES

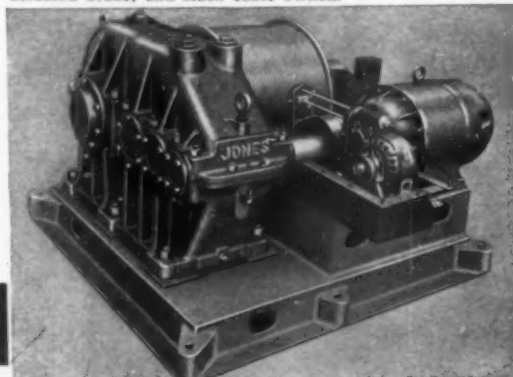
FOR speedy operation, reliable service and over-all economy the Jones Skip Hoist Drive has made a name for itself in a wide variety of material handling service. These skip hoist drives are built as complete units by the Jones organization in several types with base to take any motor specified by the purchaser. They are equipped for all the modern protective devices such as cam or nut type limit switches, solenoid or disc type brakes and slack cable switches. The drives are single, double, or triple reduction Jones Herringbone Speed Reducers, built to stand up under the many years of pounding that a skip hoist drive has to take. The shafts are supported in roller bearings, with rolling action, rack generated gear and pinion teeth to insure easiest possible starting with low starting-peak loads. All reducer bearings and gears are automatic oil-bath lubricated.

The Jones organization has an extensive file of information on skip hoist drive problems and will be pleased to work with you on any problems involving such applications

W. A. JONES FOUNDRY & MACHINE CO.
4447 Roosevelt Road, Chicago, Illinois



• The view above shows a typical Jones Skip Hoist Drive installation while the view below shows one of the Jones units equipped with traveling nut type limit switch, motor actuated brake, and slack cable switch.



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HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES
AND—FRICTION PULLEY BLOCKS • PULLEYS
FRICTION CLUTCHES • TRANSMISSION APPLIANCES

cent calcium carbonate, f.o.b., Warren, Wyo., \$1.60 per ton.

Clark Quarries, Inc., Fort Collins, Colo., 96 percent CaCO_3 , f.o.b., Rex Siding, Colo., \$1.44 per ton, with Rex Siding, Colo., \$1.44 per ton, with the following scale of prices for rock between 95.5 and 99 percent CaCO_3 :

Percent of Calcium carbonate:	Price
99.00	\$1.74
98.90	1.73
98.80	1.72
98.70	1.71
98.60	1.70
98.50	1.69
98.40	1.68
98.30	1.67
98.20	1.66
98.10	1.65
98.00	1.64
97.90	1.63
97.80	1.62
97.70	1.61
97.60	1.60
97.50	1.59
97.40	1.58
97.30	1.57
97.20	1.56
97.10	1.55
97.00	1.54
96.90	1.53
96.80	1.52
96.70	1.51
96.60	1.50
96.50	1.49
96.40	1.48
96.30	1.47
96.20	1.46
96.10	1.45
96.00	1.44
95.90	1.39
95.80	1.34
95.70	1.29
95.60	1.24
95.50	1.19

Josefson Brothers, Bellvue, Colo., 97 percent CaCO_3 , f.o.b. Owl Canyon Siding, Colo., \$1.55 per ton.

Frank H. Norberg Co., Denver, Colo., Wellsville, Colo., quarry, 98 percent CaCO_3 , f.o.b., Wellsville, \$2.25 per ton.

Providence, Utah, quarry, 96 percent CaCO_3 , f.o.b., Providence, \$2.05 per ton.

Drummond, Mont., quarry, 97 percent CaCO_3 , f.o.b. Drummond, \$1.65 per ton. "Culls" 75c per ton.

Simas Brothers, Guernsey, Wyo., 97½ percent CaCO_3 , f.o.b. Crane Siding, Wyo., \$1.55 per ton.

Order 244 fixes maximum price for Canyon Lime Co., Las Vegas, N. M., 1½-in. crushed limestone for U. S. Army airfield, at \$3.00 per cu. yd. (evidently a delivered price).

Gypsum Rock Prices

O.P.A. Order 234 under M.P.R. 188: The Monolith Portland Cement Co., Los Angeles, Calif., is hereby authorized to sell, deliver and offer for sale, and all persons are authorized to buy or receive from it in the course of trade, crude or rock gypsum at the following prices:

(1) To the points, Davenport, Simla, Redwood City, Cowell, Kentucky House and Merced, Calif., at

the price of \$3.19 per net ton, f.o.b. Gerlach, Nev., less a discount of 25c per ton for payment by the tenth day of the month following the date of invoice, and

(2) To the points Victorville, Colton, Crestmore and Los Angeles, Calif., at the price of \$3.19 per net ton, f.o.b. Arden, Nev., less a discount of 25c per ton.

Tire Purchases

NB-706: O.D.T.: In applying to local War Price and Rationing Boards for tires, tubes, and recapping service, fleet owners should bear in mind that they need not

present the unit Certificate of War Necessary covering the vehicle to be serviced. The master C.W.N. covering the fleet is sufficient provided the owner certifies on the application form that he holds a unit certificate for the vehicle to be serviced and that he has complied with the tire inspection requirements of the Office of Defense Transportation. If, in applying for tires, tubes, or recaps, a fleet owner presents a valid unit certificate, he should have it returned to him immediately after the ration board has noted its presentation on the application form.



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In order to keep your EAGLE Equipment running at maximum efficiency and economy, high priority ratings make it possible for us to supply you with repair parts, maintenance and engineering service.

Check now to see if EAGLE interchangeable parts are needed. Write or Wire.




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IRON WORKS
Des Moines, Iowa

Ready Mix Directors Meeting

A SPECIAL MEETING of the board of directors of the National Ready Mixed Concrete Association convened in New York City, April 16, to act on the resignation of its president, H. F. Garvin Pelsue, and to consider other matters of business. Mr. Pelsue, formerly of Graham Bros. Co., Los Angeles, Calif., has moved to New York City, to become general manager of the Metropolitan Sand and Gravel Co., as noted in the personal columns of this issue. Being no longer in the ready mixed concrete business, he resigned as president of the asso-

ciation, to which office he was re-elected last January after having served as president the preceding year.

Mr. Pelsue's resignation was accepted with regret and with a resolution by the board of directors thanking him for his good work. It was largely through his efforts that the "Manual of Practice" for ready mixed concrete manufacturers was drafted. To succeed Mr. Pelsue the directors unanimously elected Stephen Stepanian, vice-president,

Arrow Sand and Gravel Co., Columbus, Ohio.

EXECUTIVE SECRETARY V. P. AHEARN brought up the matter of selecting a representative from the industry to serve on an advisory committee to serve the Wage and Hour Division of the U. S. Department of Labor. This matter was taken under consideration, pending collection of wage statistics in the industry. V. P. Ahearn, executive secretary, was appointed to represent the industry, should the industry decide it wants representation.

H. F. THOMSON, St. Louis, Mo., reporting for the research committee, recommended consideration of

HAMMOND
MULTI-WALL PAPER BAGS

Sewn and Pasted
Open Mouth and
Valve Paper Bags.
Your Inquiries Invited.
WRITE TODAY!

HAMMOND BAG & PAPER CO.
Paper Mill and Bag Factory: WELLSBURG, W. VA.

ELVERITE, for wear resistance
ADAMANTINE, for abrasion-resistance,
great strength and machinability
HEAT-RESISTANT CASTINGS

THE BABCOCK & WILCOX COMPANY
85 LIBERTY STREET . . . NEW YORK, N. Y.

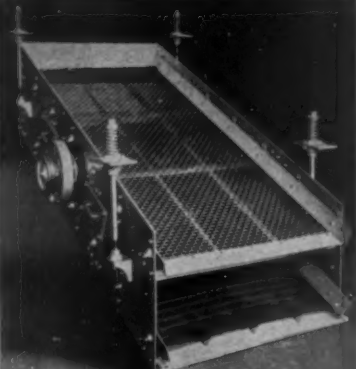


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more in a
"DAY"**

**Swing Hammer
PULVERIZER**

Its wide crushing
range makes it serve
the purpose of two or
more other types of
crushers. Roller bearing
equipped. Write
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Brooks EQUIPMENT & MFG. CO.
KNOXVILLE, TENNESSEE



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Vibrating Screen**

The Denver-Dillon Vibrating Screen has been proved by over four years of service in numerous industries. Operators report definite reduction in screening costs. "Floating circle" principle requires less than half of the average power of other means of screening. Write today for new Bulletin No. 83-B3.

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Salt Lake, Utah, McIntyre Bldg.
Chicago, Ill., 1005, 69 W. Wash.
Toronto, Ont., 45 Richmond St.
Mexico, D. F., Edificio Jalisco

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VIBRATORS**



DIAMOND

Violent vibration for fast, positive separation all over the screen—controlled by accurately balanced design for smooth action. Long life, low maintenance costs. No choking. Fast delivery. Tell us your needs. Write for Bulletin D42V.

DIAMOND IRON WORKS, INC.
11 Sizes in 1-2-2 1/2-3-4 Decks

1800 North Second St., Minneapolis, Minn.

**HAYWARD
BUCKETS**

**USE RIGHT BUCKET
FOR THE JOB**

Hayward makes all four—clam shell, dragline, electric motor, orange peel. A Hayward recommendation is unprejudiced.

THE HAYWARD COMPANY
202-204 Fulton Street
New York, N. Y.

The price situation was informally and "off-the-record" discussed by Fred Bamman of the Building Materials Division of the O.P.A. Mr. Bamman is a former contractor and has the advantage both to O.P.A. and to the industry of having a thorough knowledge of the industry. While it was thought desirable to set maximum prices for ready mixed concrete outside of M.P.R. 188, where it is now together with many other building materials, it also was thought useless to do this until maximum

To fill the vacancy of vice-president created by Mr. Stepanian becoming president, Alexander John-

- **PREformed**
- **Internally Lubricated**
- **Made from selected steels**
- **Made by craftsmen
with years of experience**



Newark, N. J.

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service



EARLE C. BACON, Inc.

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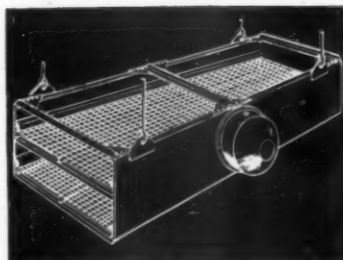
son, Brooklyn, N. Y. (Central Concrete Co.) was elected. Mr. Johnson is treasurer also of the association. To fill the vacancy on the board, through the resignation of Mr. Pelsue, Harry C. Williams, of the Blue Diamond Co., Los Angeles, Calif., was elected.

It was voted to recommend changes in the constitution and by-laws of the association to provide for a larger board of directors (at present seven); making the board membership, probably 15, with regional representation.

The following members of the board were present: H. F. G. Pelsue, president; Stephen Stepanian, vice-president; Alexander Foster, Jr., vice-president (Philadelphia, Pa.); C. W. Shirey, vice-president (Waterloo, Ia.); Alexander Johnson (treasurer); H. F. Thomson (past-president), St. Louis, Mo.; James F. McCracken (past-president), Louisville, Ky.; Joseph H. Dixey (past-president), New York City. There were also a number of producer guests present.

Suspend Freight Increases

EFFECTIVE MAY 15, the I.C.C. has ordered suspended freight rate increases averaging 4.7 percent which were authorized a year ago to offset higher wages. The suspension was made effective until January 1, 1944.



GYROSET VIBRATING SCREEN

5 DISTINCTIVE FEATURES . . .

1. Full Floating Shaft.
2. Eight Positive Stroke Adjustments (quickly changed).
3. Oil Lubricated.
4. Sturdy Construction.
5. Screen Cloth Easily Changed.



LOW COST—EFFICIENT—
ECONOMICAL

Write for Bulletin No. 939

Productive Equipment Corp.

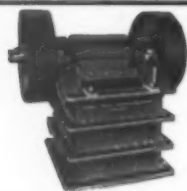
2926-28 West Lake St., Chicago, Ill.

GRUENDLER CRAFTSMANSHIP

Employed by U. S. A. in the WAR EFFORT

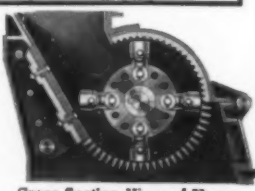
★ **ROCK CRUSHERS** ★
STATIONARY or MOBILE for Military Highways,
Access Roads, Army and Navy Air Base Construction

GRUENDLER ENGINEERS on the job to help you in any way, NOW and for your post war plans—Blue Prints or Practical Suggestions Sent—No Obligations—Write for Illustrated Bulletins and Catalog "Number 601"



Heavy Duty HiCarbon
cast steel Roller Bearing
JAW CRUSHER

Built
in many
sizes



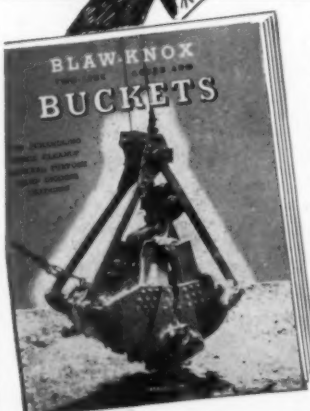
Cross Section View of Heavy
Duty HAMMER CRUSHERS
from 1 ton per hour to 500
tons per hour capacity.

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OUR FIFTY-EIGHTH YEAR

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PLANT and MAIN OFFICE—2915-17 N. MARKET + ST. LOUIS, MO.

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SEALED
BALL BEARING
SHEAVES



Sealed ball bearing sheaves in the lever arm reduce lost time and expense of bearing replacement, increase cable life and reduce friction, materially improving operating efficiency. This, and many other better features, that make BLAW-KNOX the "wise" buy in buckets are fully explained and illustrated in NEW CATALOG 1757. Send for your copy today.

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BLAW-KNOX BUCKETS

BLAW-KNOX BINS AND BATCHERS • ROAD FORMS • STREET FORMS • CONCRETE SPREADERS • TAMPING ROLLERS • VIBRATORS
CONCRETE BUCKETS • CLAMSHELL BUCKETS • TRUCK MIXERS • STRIPING MACHINES • TUNNELERS • ROAD FINISHERS • STEEL FORMS

OBITUARIES

HENRY M. HELENIAK, vice-president and sales manager, Spokane Portland Cement Co., Spokane, Wash., died recently at the age of 64. Mr. Heleniak started his career as a railroad telegrapher in Minnesota. He moved to Spokane in 1910 and entered the service of the Great Northern Railway Co. as a contracting freight agent. He subsequently joined the Spokane Portland Cement Co., where he rose rapidly to the position of vice-president.

T. WARD HAVELY, president of the Central Rock Co. and the Lexington Concrete Products Co., Lexington, Ky., passed away recently at the age of 47. Mr. Havely was a member of the board of directors of the National Crushed Stone Association and also Mayor of the City of Lexington.

DAVID C. HAMILTON, former executive of the Carbon Limestone Co., Youngstown, Ohio, died recently at the age of 74. He was born in Plaingrove, Penn., and attended Westminster College. Mr. Hamilton came to Youngstown in 1900 and became a specialist in concrete work. He was superintendent of the Concrete Sand Co. prior to his association with the Carbon Limestone organization.

EUGENE FROST, assistant general manager of the explosives department and member of the board of directors of the Atlas Powder Co., Wilmington, Del., died recently at the age of 55.

J. L. DURNELL, formerly prominent in the lime industry as an executive of the Knickerbocker Lime Co., Pennsylvania, and subsequently for a short time with its successor, the Warner Co., died recently.

LOUIS M. MAYHEW, Denver, Colo., superintendent of the Superior, Nebr., plant of the Nebraska Cement Co., subsidiary of Ideal Cement Co., died recently at the age of 63, after an illness of only a few days. He was assistant superintendent of the plant in Superior until three years ago when he was placed in full charge.

WILLIAM M. WEIGEL, mineral technologist on the staff of the Industrial Development Department of the Missouri Pacific Railroad, died recently at the age of 64, following a brief illness. Mr. Weigel was well known to ROCK PRODUCTS' readers.

PULVERIZERS for the reduction of Cement Materials, Limestone, **Agricultural Limestone**, Fire Clay and All Dry, Refractory Materials.

Capacities: 1 to 60 tons per hour

Finenesses: 20 to 350 mesh

BRADLEY PULVERIZER CO.

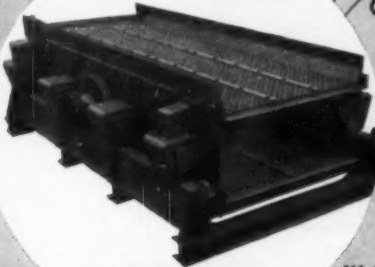
ALLENTOWN, PENNA.

To Increase Capacities or Fineness of Present Grinding Plant—
To Reduce Power and Maintenance Costs—
To Insure an Absolutely Uniform Product—

Use the BRADLEY AIR SEPARATOR

Record
Tonnes in
Screening Rock,
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Throughout
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TY-ROCK




SCREEN

Full Floating
Circle-Throw
Action
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Coarse and
Medium
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Write for
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THE
W. S. TYLER COMPANY
CLEVELAND, OHIO

MODEL 51



BLAST HOLE DRILL
CRAWLER MOUNTED AND STABLE
IN TRACTION—Short moves can
be made with derrick standing.

The outstanding feature of this modern rock drill is its welded and riveted sturdy frame. Pounding down six inch holes in hard rock, gives a rock drill a lot of jolts—and that is why KEYSTONE engineers employed a combination of both welding and riveting to give it a rugged and durable frame foundation.

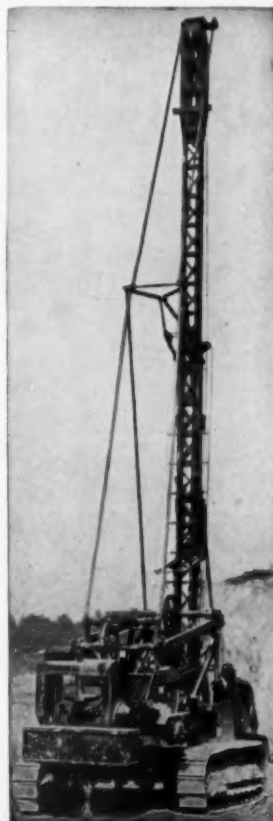
The working mechanism of the Model 51 crawler traction drill is likewise made to take rough service. Shafts and anti-friction bearings are oversized. The length and character of the stroke are adjustable to give greatest efficiency.

You can be sure of getting a superior piece of equipment that will give you dependable performance for years if you select a KEYSTONE Blast Hole Drill.

You will want to know more about it.

Write for Bulletin BD-1141.

KEYSTONE DRILLER CO.
Beaver Falls, Penna.



TALCOTT BELT FASTENERS

for Splicing and
Patching Conveyor
Elevator and Transmission Belts



Only a Hammer Needed to
Apply Talcott Fasteners

Write for Information

W. O. & M. W. Talcott, Inc.

92 Sabin St.
PROVIDENCE, R. I.

Manufacturers' News

Mack Trucks, Inc., Long Island City, N. Y., announces the appointment of A. N. Morton as production manager of the Mack company's three huge plants.

Equipment Corp. of America, Chicago, Ill., has announced the election of Joseph V. Sullivan as president of the company, succeeding H. M. Capron, who is advanced to the chairmanship of the board. M. E. Jost and L. T. Kern were elected vice-presidents, and E. H. Belfrey was reelected secretary and treasurer.

Robins Conveying Belt Co., Passaic, N. J., announces that it is shortening its name to Robins Conveyors Incorporated. Thomas Matchett, president of the corporation, advises that no change of management, personnel or corporate structure is involved in this change.

Hendrick Manufacturing Co., Carbon-dale, Pa., has been awarded the Army-Navy "E" pennant for excellence in war production.

Chain Belt Co., Milwaukee, Wis., announces the appointment of William W. Klemme as district manager of industrial sales in Dallas, Texas. Mr. Klemme was previously district manager at Buffalo, N. Y.

Bemis Bro. Bag. Co., St. Louis, Mo., announces the opening of a plant at Mobile, Ala., for manufacturing multiwall paper bags. C. E. Hayward, who has had long experience in the manufacture of bags and who has been with the Bemis Company for 18 years, will manage the plant. Shelby W. Brown, who for many years has traveled the southern territory as a representative of the Bemis factory

at New Orleans, will be the sales manager.

Link-Belt Co., Chicago, Ill., announces that Frank S. O'Neil, general manager of the company's Indianapolis operations, has been promoted to the position of vice-president. He succeeds James S. Watson, who has rounded out 50 years of service and plans to retire at the end of this year. Mr. Watson will continue as a director of the company.

Stearns Manufacturing Co., Adrian, Mich., has been awarded the Army-Navy "E" flag for excellence in war production. They are the first in the field of concrete products plant equipment to be so honored.

Fuller Co., Catasauqua, Pa., has opened a Priorities office at 1341 "G" St., N. W., Washington, D. C., to assist their customers. Channing O. Davis will be in charge of the office.

Whiting Corp., Harvey, Ill., has been awarded the Army-Navy "E" pennant for excellence in war production. The announcement was made by Howard D. Grant, president of the company.

Kensington Steel Co., Chicago, Ill., announces that, through the loyal support and efforts of its employees, it has been awarded the coveted Army-Navy "E" pennant for excellence in the war effort.

The Elmcro Corp., Salt Lake City, Utah, announces the establishment of an additional complete filtration laboratory in connection with their Chicago Office, 111 W. Washington St. The filtration engineering staff has been enlarged and Paul Richter has been placed in charge of the filtration equipment department, replacing C. J. Peterson.

Traylor Engineering & Manufacturing Co., Allentown, Penn., was presented its Army-Navy E award on May 5.

GENERAL



**SHOVELS and CRANES
GIVE YOU MORE!**

They Deserve Good Care

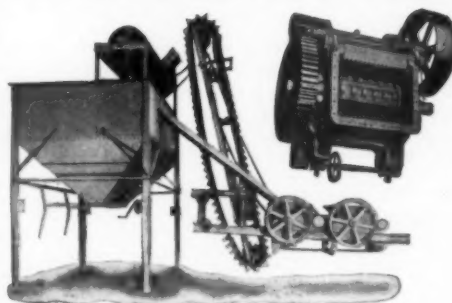
THE GENERAL EXCAVATOR CO.

MARION, OHIO

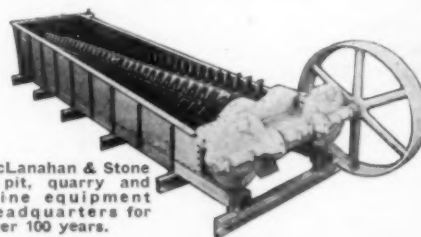
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McLanahan equipment will prepare your plant for more business. Single and double roll and jaw crushers, hammermills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, and hoists—complete portable, semi-portable and stationary crushing, screening, and washing plants for different capacities of any materials.



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— pit, quarry and
mine equipment
headquarters for
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McLanahan & Stone Corp. Established 1835
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PIONEER CONVEYORS

Sectionalized Steel Frames
Save Time—Money and
Material.

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Specify Pioneer on
your next job.

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Manufacturers of Quarry, Gravel Pit and Mining Machinery

PERFORATED METAL SAND AND GRAVEL SCREENS

Manufactured exactly to your specifications
Any size or style screen, in thickness of steel
wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices

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WILFLEY centrifugal SAND PUMPS



for Slurries, Sand Tailings
Slimes, Acid Sludges

Save Pumping
Cost

Continuous operation
without attention for
long periods. Stuffing
box, stuffing, gland
water ALL eliminated.
Close clearances main-
tained by easy slipper
seal adjustment. Heavy

pumping parts of material best suited for YOUR particu-
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you can buy. Write for Complete Catalog

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NEW YORK OFFICE: 1775 BROADWAY

SUPER-LOY

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LUDLOW-SAYLOR

WIRE CO. ST. LOUIS

New and Rebuilt Equipment

KILNS, COOLERS, DRYERS

CRUSHERS, TUBE MILLS,

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MOTORS, GENERATORS AND

ELECTRICAL EQUIPMENT

Inquiries invited. Consult us regarding your equip-
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WEBBER EQUIPMENT CO.

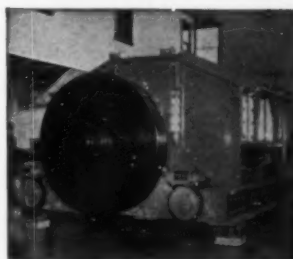
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New York

Phone MURRAY Hill 2-6511-2-3

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ready to "go on the line" in a new Cement plant designed
for top efficiency in every Department.



- Major crushing by smashing impact
 - Automatic hammer turning
 - Product sizing control, and wear compensation, assured by Duplex cage adjustments
 - Reduced power demand
 - Sharply cut maintenance cost
- are some of the outstanding advantages which this REVERSIBLE Hammermill will provide in the Secondary Preparation for modern Raw Side Grinding Mills.

Send for Bulletin No. 1000, and PUT YOUR REDUCTION PROBLEMS UP TO US.

PENNSYLVANIA
CRUSHING MACHINERY

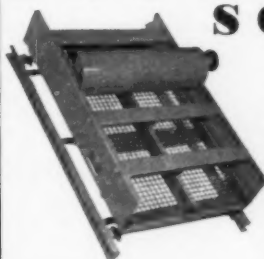
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PHILADELPHIA, PA.

UNIVERSAL SCREENS

and

"UNIVIBE" RIDDLES

Complete line of—
Tried, Proved and Guaranteed
Vibrating Screens. Since 1919, the
BEST in screening equipment at
the LOWEST COST.



NEW! 32-page Catalog
on Screens and
Screening. Just ask for Cata-
log No. 167.

UNIVERSAL VIBRATING SCREEN CO.

RACINE — WISCONSIN

Classified Advertisements

POSITIONS WANTED — POSITIONS VACANT
Set in six-point type. Minimum \$1.00 each insertion, payable in advance.

INFORMATION—Box numbers in care of our office. An advertising inch is measured vertically in one column. Three columns, 30 inches to the page.

CLASSIFIED—Displayed or undisplayed. Rate per column inch, \$5.00. Unless on contract basis, advertisements must be paid for in advance of insertion.

TEAM UP FOR VICTORY with "CONSOLIDATED"

BALL AND TUBE MILLS

- 2—UNUSED 7'x23'9" Tube Mills, iron lined, each including 400 H.P., 3/60/2200 v. slip ring motor and starting equipment.
- 1—5'x21' Smidth Tube Mill, iron lined.
- 2—5'x20' Bonnot Tube Mills, silex lined, cast steel heads for direct gear drive.

DIRECT HEAT ROTARY DRYERS

- 3—4'x30' Ruggles-Coles, now at Rochester, N. Y.
- 1—5'x24' Ironquills, made by Lancaster Iron Works, at Newark, N. J.
- 1—5'x30' Cummur, Now at Newark, N. J.
- 2—6'x50' Traylor Eng. & Mfg. Co.
- 4—5'x40' Ruggles-Coles, single shell. Now at Boston.

RAYMOND PULVERIZERS

- 3—4 roll low side Mills, each with fan, cyclone, interconnecting piping.
- 1—5 roll high side type, with "whizzer" separator and everything complete, including motors, steel supports, etc.

HARDINGE CONICAL BALL MILLS

- 1—4'x16" Iron lined, with A.C. motor and silent chain drive.
- 1—6'x22" Iron lined, with silent chain drive, with or without motor.

ROTARY KILNS

- 2—8'x125' Vulcan Iron Works.
- 1—7' & 8'x80' Traylor.
- 4—5'x7'x80' Vulcan and Reeves.
- 1—5'x50' Vulcan.



CONSOLIDATED PRODUCTS COMPANY, INC.

15-16-17 PARK ROW

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Shops and Yard at Newark, N. J., cover eight acres.

CRUSHING ROLLS

- 1—20"x14" Sturtevant, full balanced type.
- 1—Set 36"x16" Sturtevant.
- 2—40"x16" Colorado Iron Works.
- 1—42"x16" Allis-Chalmers.

WASTE HEAT BOILER PLANT

4—750 H.P. Edgemoor Waste Heat Boilers, all ASME, last insured for 200 lbs. working pressure. Including super-heaters, economizers, fuel fans, boiler feed pumps, steel stacks, feed water heater, etc. All in one installation and in good operating condition.

- 3—12-ton Whitecomb Locos., 36" gauge. (One can be changed to std. gauge.)
- Bucyrus-Erie Gas-Air Shovel-Crane, 1 1/4 Yd.
- 27-E Smith Paver Boom and Bucket.
- Sullivan Turbinair Hoist, 2000 lbs.
- 50 HP Locomotive Boiler, Nat. Bd.
- 15 Yd. Steel Bin, 2 compartment.
- Barnes 4" Gas Self-Pr. Pump.
- Shovel Attach for 41-B Bucyrus-Erie.
- Front Drum, Erie B or B-2.
- Fairleads Byers 1 1/4 Yd. Dragline.
- 4—1 Yd. Union Rd. Shaft-Buckets.
- 1/2 and 1 Yd. Tipover Buckets.
- Gard-Denver Compressor, 630 A. Air, Elec. Dr.
- 5—Electric Hoists, 40, 50 and 60 HP.

J. T. WALSH

Brisbane Bldg. Buffalo, New York

Crushers—Kent Mill; Sturtevant No. 2; 3' & 2' Cones; Newhouse 7" inc. motor; Msc. others.
Vibrating Screens—4x8, 2 deck; 3x6-3 deck. Buda 4 cyl. 6x8 Diesel Engine. Overhauled. 20 HP Continental 4 cyl. gasoline motor.
Link-Belt Fairleads for 2 yd. machine.
Shovel Front for P & H 3/4 yd. Mac. others.
Kohler 1500 Watt Lighting Plant, 110 volt.
Buckets—3/4 yd. Rehandler, low price. Also 3/4 yd. Owen, rebuilt. Msc. Others 3/4 to 5 yd.
James Wood, 53 W. Jackson Blvd., Chicago, Ill.

JAW CRUSHERS

- 1—MENDY, Blake Type, 10"x16"—Sectionalized Frame.
- 1—GOOD ROADS, 10"x30"—Roller Bearings.
- 1—FARREL, Blake Type, 13"x24"—B Pattern.
- 1—FARREL, Blake Type, 13"x30"—Style A.
- 1—ALLIS-CHALMERS, Blake Type, 15"x24"—Heavy Duty.
- 1—UNIVERSAL, 15"x24"—Cast Steel Frame.
- 1—ALLIS-CHALMERS, 18"x30"—Blake Type.

GYRATORY CRUSHERS

- 1—KENNEDY-VAN SAUN, No. 6—Gearless.
- 1—ALLIS-CHALMERS, Size 4, Style K—Gates.
- 1—ALLIS-CHALMERS, Size 5, Style N.

REDUCTION CRUSHERS

- 1—STURTEVANT Gyratory, New No. 2—Open Door Type.
- 1—KENNEDY-VAN SAUN, No. 37, Gearless—Synchronous Motor Drive.
- 1—TRAYLOR, 10" "Bulldog"—Type T.

SPEED REDUCERS

- 3—FAWCUS, Double Reduction Herringbone Gears, Ratio 41-1, 45-100 HP.
- 1—FAWCUS SPEED REDUCER, Double Reduction Herringbone Gear, ratio 109-1, 23-48 HP.
- 1—FAWCUS GEAR BOX REDUCER, ratio 4.94-1, 43-65 HP.

MORSE BROS. MACHINERY CO.

P. O. Box 1708
Denver, Colorado

FOR SALE

- 1—Structural Steel Overhead Crane Runway, 780 ft. long, 80 ft. span. Was intended for 10 ton crane. 24" I-Beam with 10" channel united to I-Beam for lateral support. 80 lb. rail on top. Supports 20' apart and made up of 12" I-Beams, 12" channels and braced with 2 1/2" x 3" x 1/8" angles.

- 1—Kennedy-Van Saun Hammermill Crusher, 54" Dia. x 48".
- 1—Kennedy-Van Saun Slugger Roll Crusher, 36" Dia. x 48".

Equipment bought new. Never used. Excellent condition. Telephone, Wire or Write—F. Clay Oxford, Receiver for American Portland Cement Co., Foreman, Arkansas. Tel: 199.

FOR SALE

RAYMOND PULVERIZING MILL, 5 roller construction, capacity 33 tons in 12 hours, operates at 217 R.P.M., fan at 1760 R.P.M., grinds minerals to 99% mesh. In good substantial condition, available inspection, priced reasonable. Location in Mercer County, Ky. Contact Brandeis Machinery & Supply Company, Brook and Warnock Sts., Louisville, Ky. Phone Magnolia 6690. No priority required.

MODERN RECONDITIONED EQUIPMENT

For Sale Without Priority

CRUSHERS—SCREENS

- 2' SYMONS Coarse Bowl
- 15x24 Jaw Crusher
- 36"x48" Jeffrey Spike Rolls
- 48"x12' 2 Deck SYMONS Screen
- 48"x6' 1 Deck SYMONS Screen
- 42"x18" Trommel Screen

Also Scales — Road Rollers — Batch Bins — Conveyors
LARGE STOCKS — IMMEDIATE SHIPMENTS

BROWN-BEVIS EQUIPMENT CO.

4900 Santa Fe Ave.

Los Angeles, Calif.

PAVING EQUIPMENT

- 3000-lb. Portable Asphalt Plant, with Dryer, Scales, Motors.
- BARBER-GREENE Travel Plant. Heavy-duty, nearly new.
- BLAW-KNOX Cement Finisher. Double Screed, Gas Electric.

BELT CONVEYORS IN STOCK



12"—14"—16"—18"
20"—24"—30"—36"

ALSO CONVEYOR BELTING

1943 Catalog No. 44 on

Request

"The test of time since '99"

TEUSCHER PULLEY & BELTING CO. 801 N. 2nd ST.,
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Monaghan 3-W. 3-T. and 2-W Draglines.
Monaghan 3-T Electric, late type walkers.
1 1/2 yd. Diesel Cat. Shovel-Drag-Crane.
1 1/2 yd. Diesel Cat. Dragline-Crane.
1 1/2 yd. Gas Shovel, completely overhauled.
Northwest 104 Dragline-Crane, 45' boom.
1/2 yd. Gas Shovel, Crane & Dragline.
20 ton Gas Locomotive, Std. Gauge.
Drag Scrapers & Slacklines, Buckets, etc.
Loco. Cranes—15 ton Browning; 20 ton Ohio.
James Wood, 53 W. Jackson Blvd., Chicago, Ill.

No. 9 Stearns Jolterete machine used about
2 1/2 years, complete with 8x12x16 attach-
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Approx. 6,000 12x16 steel cored pallets.
Approx. 2,000 NEW 18 1/2"x26" plain steel
pallets for Besser machine.

Concrete & Cinder Blocks Products Co.
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2 1/2-yd. Diesel Electric Shovel wanted
for both dirt and rock loading. Bucy-
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Rock Products, 309 W. Jackson Blvd.,
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50,000' of following HEAVY DREDGE
STEEL PIPE: 8 1/2" OD, 10 1/2" OD,
12 1/2" OD, 15" OD, 16" OD and 18" OD.
Full information on request.

CENTRALIA PIPE & SUPPLY CO.
218 W. Calumet Centralia, Ill.

You never can tell who may
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List your idle equipment in a
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ROCK PRODUCTS and con-
vert it to ready cash as well
as helping our war effort at
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- 1—Vulcan 6"x42" Rotary Dryer, 1/2" shell.
- 2—8'x125' Rotary Kilns.
- 2—Raymond Mills, 4 and 5 roll.
- 1—Raymond No. 1 Impact Mill.
- 12—Jaw Crushers, 3"x5" to 84"x56".
- 16—Hammer Mills, Williams, Jeffrey, Gruendler, 5 to 100 HP.
- 3—Dryers, 5'x60", 5'x30".
- 1—Jeffrey Hammer Mill, 24"x36".
- 1—Allis Chalmers Fairmount Crusher, 36"x60".
- 1—No. 5 McCully Crusher.
- 2—Allis Chalmers Combel Mills.
- 1—Bradley Hercules Mill.
- 20—Steel Bins, 10 to 500 tons.
- 15—Bucket Elevators, 12' to 75' centers.
- 3—Tyler Hammer Screens.
- 500' Screw Conveyor, up to 12".
- 2000' Belt Conveyor, 12" to 24".

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- 1 Universal Power Stripper. Like new.
- 1 Besser 9 cu. ft. Mixer
- 1 1/2-Yard Bucket (Drag Line)
- 1 20' Vibrating table for 8" joists (complete).
- 50 Steel Racks
- 1 Hand Lift Truck
- 1 Bystone Mixer 12 cu. ft.
- 1 25 H.P. Vertical H.P. Boiler
- 1 20 H.P. Kewanee Firebox Boiler
- 1 150 H.P. Horizontal Boiler
- Write Box B-3, Rock Products,
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FOR SALE—GOOD CONDITION

6" and 8" Hetherington & Berner dredge
pumps, belt drive, 42" screen, wash
box and elevator for gravel washer.
Concrete block machinery—concrete
mixers. 20 h.p. 1140 r.p.m. motor.
Worthington 10" pump, bronze impeller.

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HOIST, single drum Superior Iron Works, 36"
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6—4-yard Jaeger Separate
Engine Drive Truck Mix-
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trucks.

2—3-yard Blaw-Knox Sepa-
rate Engine Drive Truck
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Mack trucks—1937.

2—4-yard Blaw-Knox Sepa-
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Mixers mounted on A.C.
Mack trucks.

1—6-yard Jaeger Separate
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er mounted on Model DC
100 Autocar with dual
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2—4 Ton WESTINGHOUSE, 250 V.,
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BLOCK MACHINES FOR SALE

1—Automatic Anchor Double Bar
Tampers, will make 3"-4"-6"-8"-10"-
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Power Feeder. Will sell at a bar-
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17—"KOPPEL" V-DUMP ALL STEEL
CARS. 36-in. gauge — 1 1/2 yard ca-
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- BELT**
Used 1080 V. belt.
- BOILERS**
1 25 H.P. Upright high pressure boiler.
- ELEVATOR BUCKETS**
29 20x12x11—10 ga. continuous elevator buckets punched for belt.
- BULLDOZER**
1 T.D. International Diesel—Gar Wood Blade.
- CHAIN**
100' Link-Belt No. 83 det. chain, malleable, new.
250' Link-Belt No. 103 det. chain, malleable, new.
- COMPRESSORS**
1 100 cu. ft. Chicago pneumatic portable compressor, gas engine driven.
1 110 cu. ft. Ingersoll portable compressor.
- CONVEYORS**
1 24" Barber Green conveyor, 44' long.
1 14" flat belt conveyor 26'-6" centers.
1 14" belt conveyor 8' long, less belt.
1 18"x37' conveyor on Caterpillar tractor, as is, f.o.b. New Holland, Pa.
- CRANE**
1 No. 105 Northwestern crane, 55' boom with 1 1/2 yd. shovels and 3/4 yd. clam.
1 3/4 yd. Brown crane—40' boom, 21 ton, Serial No. 10366.
- GYRATORY CRUSHERS**
1 6" Traylor gyratory crusher.
1 7" Allis-Chalmers gyratory crusher.
1 8" Traylor gyratory crusher.
1 6" Allis-Chalmers gyratory reduction crusher.
1 No. 37 Kennedy reduction crusher with synchronous motor, 50 H.P., 440 volt.
1 No. 40 Tel-smith reduction crusher.
1 No. 10A Tel-smith primary breaker, rebuilt.
1 No. 10B Tel-smith primary crusher, rebuilt.
1 2" Tel-smith cone crusher.
- HAMMER CRUSHERS**
1 No. 101A Stover pulverizer.
1 No. 15 Williams pulverizer.
- JAW CRUSHERS**
1 18x36 Buchanan jaw crusher.
1 7"x12" New Holland jaw crusher on steel truck.
1 15"x36" Cedar Rapids jaw crusher.
1 9"x36" Wheeling jaw crusher.
1 10"x36" Case portable jaw crusher.
1 18"x36" Cedar Rapids overhead, eccentric with feeder and 75 H.P. motor mounted on one chassis and V belt drive.
1 36x10—B Farrell jaw reduction crusher.
1 15"x36" Farrell jaw crusher.
1 13"x24" type B Farrell jaw crusher.
1 15B 24"x36" Farrell jaw crusher.
1 8"x36" Acme reduction jaw crusher.
1 No. 20 22"x50" Good Roads jaw crusher.
1 6"x12" Good Roads jaw crusher.
1 No. 6 Champion jaw crusher.
1 11"x22" Tel-smith jaw reduction crusher.
1 No. 4 Champion jaw crusher.
- ROLL CRUSHERS**
1 16"x16" New Holland two-roll crusher.
1 10"x12" New Holland two-roll crusher.
1 10"x16" double set New Holland roll crusher.
1 10"x16" double set New Holland roll crusher.
1 Complete Crushing Plant:
1—No. 6 Champion crusher.
1—18" inclined elevator 60" centers.
1—125 H.P. slip ring motor, 3 ph., 60 cyc., 220 v.
1—15-ton Fairbanks truck scales.
- ELEVATORS**
1 40' Jeffrey inclined elevator. Buckets 26x12x17 1/2".
1 70' inclined elevator. Buckets 26"x12"x10"x 1/2".
1 26' inclined elevator. Buckets 18"x10"x8" ga. 15"x 1/2".
1 30' inclined elevator. Buckets 36"x17 1/2"x15"x 1/2".
1 49' No. 4 Tel-smith belt elevator.
1 55'-6" No. 4 Tel-smith belt elevator. Buckets 12"x11 1/2"x7 1/2" No. 12 ga.
1 57'-6" enclosed type vertical elevator. 16" malleable buckets and 15 H.P. motor.
- ENGINES**
1 100 H.P. Cooper Bessmer Diesel.
1 75 H.P. Fairbanks-Morse Diesel.
1 52 H.P. 4DT212 Buda Diesel.
1 52 H.P. 4DT226 Buda Diesel.
1 Waukesha gasoline motor 6 cyl. Model No. 6ZK13.
1 80 H.P. Buda Diesel 6D415.
1 81 H.P. K428 Buda gasoline motor.
- FEEDERS**
1 16" Tel-smith reciprocating plate feeder.
- GATES (Bin)**
2 24" x 24" clam type, all steel bin gates. Height 18" overall, width 30".
- GEAR**
1 Spur Gear 2 1/2" pitch, 75 1/2" P Diameter, 7 1/2" face, 6" bore, cast iron cast tooth.
- GENERATORS**
1 170 K.W. generator, 3 ph., 60 cyc., 440 v. direct connected to 200 H.P. De LaVergne Diesel engine.
- GRADER**
1 McCormick Deering grader on Caterpillar tread. Gasoline engine driven.
- LOCOMOTIVE**
7 ton Plymouth. Standard gauge track. 4 cyl. Clymox motor.
- HAMMER MILL**
1 No. 4 Williams plain bearing hammer mill.
- MIXER**
1 2 yd. Jaeger mixer with Hercules engine on 1 1/2 ton Dodge truck.
- MOTORS**
1 40 H.P. Westinghouse type CW slip ring, 690 R.P.M., 3 ph., 60 cyc., 220 v.
1 3 H.P. Westinghouse type CS motor 3450 R.P.M., 8 ph., 60 cyc., 220 v.
1 75 H.P. General Electric slip ring motor 870 R.P.M., 3 ph., 60 cyc., 220 v.
1 100 H.P. Westinghouse slip ring motor, 3 ph., 60 cyc., 440 v., 690 R.P.M.
1 35 H.P. Western Electric slip ring motor, 3 ph., 60 cyc., 220 v., 1150 R.P.M.
1 25 H.P. General Electric squirrel cage, 3 ph., 60 cyc., 220 v., 720 R.P.M.
1 50 H.P. Westinghouse CW slip ring motor, 690 R.P.M., 220 v., 3 ph., 60 cyc.
73 1/2 H.P. General Electric, 1750 R.P.M., 3 ph., 60 cyc., 220 v. Tapered shaft.
1 25 H.P. GE 3 ph., 60 cyc., 220 v., 1750 R.P.M.
1 40 H.P. Allis-Chalmers slip ring motor, 3-60-220 v., 1150 speed.
1 20 H.P. Western Electric 3-60-220 v. motor, 1150 speed.
3 25 H.P. Fairbanks-Morse, type B squirrel cage, 1160 R.P.M., 3-60-220. Sleeve bearing. Selling price.
1 15 H.P. Fairbanks-Morse, type B squirrel cage, 560 R.P.M., 3-60-220. Sleeve bearing. Selling price.
2 35 H.P. Fairbanks-Morse, type B squirrel cage, 870 R.P.M., 3-60-220. Sleeve bearing. Selling price.
1 35 H.P. General Electric, type 1 form K, squirrel cage, 870 R.P.M., 3-60 cyc., 440 v. with sliding base sleeve bearing. Selling price.
1 35 H.P. Fairbanks-Morse, type B squirrel cage, 1160 R.P.M., 3-60-220, sleeve bearing. Selling price.
- PIPE**
3 pcs. 4" 60' 648 lbs.
9 pcs. 6" 320' 6080 lbs.
8 pcs. 7" 150' 3530 lbs.
3 pcs. 8" 40' 990 lbs. per lb.
- PULLEY**
1 30" dia. x 36" belt conveyor pulley with 2 1/2" shaft.
2 20" dia. x 42" belt conveyor pulley with 2 1/2" shaft.
1 30" P.D. 8-C groove V belt pulley 2 1/2" bore.
1 18" dia. x 30" belt conveyor pulley 3 1/2" bore.
1 8x15 cast iron, solid, 3 1/2" bore.
1 6x12 cast iron, solid, 3 1/2" bore.
10 8 1/2" P.D. 8-C groove V belt pulley 2 1/2" bore.
12 50" P.D. 8-C groove V belt pulley (split) 2 1/2" bore.
- PUMPS**
1 Rex 4" self primary pump. Direct connected to 4 cyl. air cooled Wisconsin engine, mounted steel wheels.
1 Lake Wood Triplex road pump, direct connected to 4 cyl. Waukesha gasoline power unit. Pump Model No. 85. Cyl. size 3 1/2"x6".
1 Humdinger pump fig. 700-4, Serial 1679, powered by 2 cyl. LeRoi gasoline motor direct connected to 4" cent. pump mounted on steel truck.
1 Worthington 1 1/2" D8 cent. pump, direct connected to 1 H.P. Master 3 ph., 60 cyc., 220/440 v.
1 Triplex pump, size 4"x4", belt driven.
1 1 1/2"x1 Westco cent. pump, 2 H.P. Peerless 3 ph., 60 cyc., 220 v. direct connected.
- REDUCERS**
1 Foote Bros. speed reducer type 27W 11 1/4 ratio. Worm gear. Rated 33 1/2 H.P. at 1000 R.P.M. of input shaft.
1 Foote Bros. Herringbone speed reducer type 8 S.H. ratio 2.57 to 1.
- ROLLERS**
1 8 ton Wehr, 3 wheel roller. 4 cyl. gasoline engine driven.
1 5 ton Buffalo Springfield Tandem steam roller.
- SCALES**
1 50 ton Fairbanks truck scales. Size of platform 22'x9'.
1 15 ton Fairbanks truck scales.
- SCOOP**
1 Large tractor dirt scoop on wheels.
2 Heil scoops, 12 yd. capacity.
- SCREENS**
2 40" dia. revolving screens, 18' lg.
1 33"x12" revolving screen.
1 48"x24" revolving screen.
1 Tel-smith rotary scrubber screen, 32" dia. barrel, 14'-6" lg.
1 48"x72" Link-Belt revolving sand and gravel scrubber.
1 New Holland 2 deck 24x48 vibrating screen.
1 Summit 2 deck vibrating screen size 48"x96".
1 Summit 2 deck vibrating screen size 5'x8".
- SHOVELS**
1 3/4 yd. P. & H. shovel, chain crowd, 4 cyl. Waukesha gasoline motor.
1 1/2 yd. Model 16B Erie shovel.
1 1/2 yd. Model 27 Lorraine V8 gasoline motor.
1 1/2 yd. shovel attachment for P. & H. shovel.
1 1/2 yd. Model M Allis-Chalmers shovel.
1 75A Lorraine. Rebuilt. 1 1/2 yd.
1 1/2 yd. Thew shovel combination, gas with 25' crane boom.
1 1/2 yd. General skimmer attachment.
1 1/2 yd. Universal crane with 30' crane boom and clam shell on 10 wheel truck.
1 1/2 cu. yd. back hoe for Byers shovel 42" wide.
- SWITCHES**
1 220 amp. Square D safety switch, 3 pole, 220 v.
1 400 amp. Trumbull type "A" safety switch, 3 pole, 220 v.
1 400 amp. Square D safety switch, 3 pole, 220 v.
1 420 amp. Trumbull type "C" safety switch, 220 v., 3 ph.
- TANKS**
2 No. 7 Tel-smith sand tanks.
- TRAILER**
1 Kingham 35', 9 ton pole trailer with pneumatic tires and pneumatic Booster hydraulic brakes.
- TRANSFORMERS**
3 15 KVA General Electric current transformers, single phase, Form K 50/60 cyc. Voltage 2400/4800/8320/240/480.
- WAGON**
1 18 yd. La Plant-Cheate rubber tire dump wagon.
- SAND WASHERS**
1 Twin speed sand washer. Steel box. 144"x38"x 1/4" thick. Screws 14" dia.

Crushers
Pulverizers
Elevators
Screens

Conveyors
Power Mowers
Belted
Engines

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3 miles from Phillipsburg, N. J. and Easton, Penna.

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- 6—Vulcan Iron Works steel rotary kilns, 8'6"x7'6" dia., 125' long, fire brick lined.
- 2—Vulcan Iron Works steel rotary kilns, 7'6"x2' dia., 125' long, fire brick lined.
- 7—W. F. Mosser & Son steel rotary kilns, 5'6"x5' dia., 60' long, fire brick lined.

DRYERS

- 3—W. F. Mosser & Son steel rotary dryers with 65" steel stack.
- 2—W. F. Mosser & Son steel rotary dryers, 72"x60" dia., 60' long, bevel gear drive, each with counter shaft and 40' steel stack.
- 1—W. F. Mosser & Son steel rotary dryer 72"x60" dia., 55' long, bevel gear drive, with counter shaft and 35' steel stack.
- 1—W. F. Mosser & Son steel rotary dryer, 72"x60" dia., 55' long, bevel gear drive, with counter shaft and 50' steel stack.

CONVEYORS

- Rubber Belt Conveyors, 10", 20", 24".
Continuous Pan Conveyors, 18" Link Belt.
Steel Screw Conveyors, 12", 16" in steel box.
Steel Screw Conveyors, 6" in steel trough.
Canvas Belt Conveyors, 30".
Thousands of feet, all lengths.

AIR COMPRESSORS

- 1—Ingersoll-Rand 18"x14"x18" horizontal duplex air compressor, belted motor drive, with 3'6"x20" riveted steel air receiver.
- 1—Ingersoll-Rand Duplex Air Compressor, 11"x16"x18".

3 BOILER PLANTS COMPLETE

- 2—800 HP Edgemoor Waste Heat Boilers each 200 lbs. pressure, complete with motor driven fans, economizers, super heaters, and steel stacks.
 - 3—800 HP Babcock & Wilcox Waste Heat Water Tube Boilers, 200 lbs. working pressure, complete with motor driven fans, economizer, and steel stacks.
 - 2—400 HP Babcock & Wilcox Water Tube Boilers, 200 lbs. pressure, Combustion Eng. Co. type E boilers.
- All complete with Blowers, Boiler Feed Pumps and Feed Water Heaters.

BINS and HOPPERS

- Over 250 steel plate storage bins and hoppers. Various sizes.

MACHINE SHOP

- Complete machine shop consisting of 5 lathes
2—12", 3—24" & 24", 40" swing 5', 6', 10', 12', 2—18", 22" bed. Drill press, belt threading machines, boring mill, shaper, slotting machines, planer, miller, steam hammer, etc.
1—Vertical Double Head 57" Boring Mill.

CRUSHERS

- 1—Allis-Chalmers Fairmont Roll Crusher, 36"x60".
- 2—No. 6 Gates gyratory rock crusher.
- 1—No. 6 McCully gyratory rock crusher, style K.
- 3—No. 5 Gates gyratory crushers.
- 1—Mosser rotary slinker crusher.
- 1—No. 10 McCully gyratory rock crusher with extra gear, eccentric and bell.
- 1—Jeffrey 24"x24" single roll coal crusher.

PULVERIZERS

- 26—42" Fuller Lehigh Pulverizers, each with belt idler.
- 3—33" Fuller Lehigh pulverizers, each with belt idler.

TWO COMPLETE COAL PULVERIZING PLANTS

consisting of:

- 4—Fuller Lehigh Pulverizers—Jeffrey 24x24 Coal Crusher, Ruggles 6'x41' Rotary Dryer, Conveyors, elevators, etc.
- 3—Fuller Lehigh Pulverizers—5x30 Ruggles Rotary Dryer, conveyors, elevators, etc.

BUCKET ELEVATORS

Thousands of feet of bucket elevators, all sizes of buckets, mostly all steel casings.

New Buckets and Gears.

230 V. D.C. ENGINE SETS

- 1—Penn. Iron Works, horiz. cross compound Corliss steam engine, direct conn. to 475 Kw. G. E. generator, 100 R.P.M.
- 1—Allis-Chalmers 18"x36"x42" horiz. cross compound Corliss steam engine, direct conn. to 400 Kw. Al.-Ch. D.C. generator, 100 R.P.M.
- 1—C. & G. Cooper Co. 24"x40"x35" horiz. cross compound Corliss engine, direct conn. to Cr. Wk. 575 Kw. D.C. Generator.
- 1—Robt. Wetherill & Co. Tandem Compound Corliss Steam Engine 20"x34"x42" direct conn. to 400 K.W. Ch. D.C. Generator. Complete with switchboard, instruments, etc.
- 1—Rice & Sargent Cross Compound Corliss Steam Engine 24"x48"x48" direct conn. to 800 K.W. Gen. Elec. D.C. Generator.
- 1—Southward F. & M. Co.—Cross Compound Corliss Steam Engine, 24"x48"x43" direct conn. to 750 K.W. Gen. Elec. D.C. Generator.

MILLS

- 1—Williams mill, size 3.
- 5—No. 8 Krupp steel ball mills, spur geared, with counter shaft.
- 1—Allis-Chalmers Combes Mill complete, gear driven from counter shaft through magnetic clutch, and with induced fan ventilation and dust collectors.
- 14—30" Griffin Mills.
- 1—Bradley Hercules Mill complete with stilted die ring, feeder, counter shaft.
- 1—Allis Chalmers steel ball mill, 7' dia. x 30' long, spur geared, with rope drive.
- 1—5x20 Smith Steel Ball Mill.

QUARRY

- 2—Steam shovels, Bucyrus, 70-ton 2½ yards.
- 1—Steam shovel, Vulcan Little Giant, 35-ton 1½ yards.
- 1—Double drum steam hoist, S. Flory Mfg. Co., 11"x14" duplex.
- 3—Brunkville Fardson locomotives.
- 1—Westinghouse 60" single drum electric hoist.
- 1—Bucyrus No. 40—H steam shovel.
- 3—Locomotive Cranes, steam driven.

DUST COLLECTING SYSTEMS

- 6—W. W. Sly Dust collecting systems, each with exhaust fan, 10 H.P. motor and cyclone dust collector.

230 V. D.C. MOTORS

- 1—300 H.P. Electric Dynamo 500 R.P.M.
 - 2—250 H.P. Waghoe.
 - 3—150 H.P. Diehl Mfg. Co.
 - 1—150 H.P. Gen. Elec.
 - 1—125 H.P. Gen. Elec.
 - 1—125 H.P. Gen. Elec. 550 R.P.M.
 - 1—110 H.P. Waghoe.
 - 1—100 H.P. Waghoe.
 - 1—100 H.P. Al.-Ch. 335 R.P.M.
- Hundreds of motors from 7½ H.P. up. All with starters.

MISCELLANEOUS

- 2—Hawe Scales 52"x70"—Fairbanks Morse Scale 42"x42".
 - 4—Buffalo forge blowers & exhausters.
 - 2—Poldometers, 1—30"x4'6" and 1—20"x4'6" each with standard Hoppers and 3 H.P. motor.
- Complete Stock Room Supplies, New Gears, Bearings, Bolting, Conduit, Safety Switches, Complete Laboratory, Pumps, Shafting and Pulleys, etc.

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45 BOND STREET

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NEW YORK, N. Y.

FOR SALE

Sauerman Drag Scraper Outfit Consisting of:

- 1 Crescent Bottomless Drag Scraper 2½ c.y.
- 1 Crescent Bottomless Drag Scraper 1½ c.y.
- 1 Clyde Iron Wks. Holst. 2 drum, roller bearing. Capacity 14,000 lbs. at 300 FPM front drum and 4,700 lbs. at 600 FPM rear drum
- 1 Set Roller Bearing Durolite Blocks
- 1 Mast, wooden, 22'
- 1 Fairbanks-Morse 125 HP 440V motor

Gasoline Engines

- 2 Twin City Model KEU power units, 4 cyl. 28 HP with Twin Disc Clutches

Ready-Mixed Concrete Tanks

- 18 Clinton 3½ c.y. Agitators
- 3 Clinton 2 c.y. Agitators

Screens, Rotary

- 1 6' x 16' Primary Scalping
- 1 6' x 12' Primary Scalping

Washing Equipment

- 2 72" Link-Belt Sand Cones
- 2 96" Link-Belt Sand Cones
- 1 Link-Belt Rotoscoop 12' dia.
- 1 60' x 96" Scrubber

Crushing Equipment

- 1 Allis-Chalmers McCully Superior gyratory crusher 16"
- 1 Allis-Chalmers Fine Reduction crusher 6"

Conveying Equipment

- 50 Link Belt Type 40, 36" Troughing Idlers
- 87 Link-Belt Type 80, 36" Troughing Idlers
- 24 Link-Belt Type 41, 36" Return Idlers

Feeders

- 1 60" x 72" Jeffrey Grizzly Pan Feeder

Cranes

- 1 LeTourneau AD-3 with steel wheels without F.C.U.

Buckets

- 1 Hayward Power Wheel 2 c.y. reh. clam
- 1 ¾ c.y. shovel bucket
- 1 1½ c.y. shovel bucket

Motors, Electric, with Controls

- 1 125 HP Fairbanks-Morse 440V. 900 RPM
- 1 75 HP Westinghouse 200 V. 685 RPM
- 1 75 HP Gen. Elect. 440 V. 695 RPM
- 1 35 HP Allis-Chalmers 220 V. 850 RPM

Pump

- 1 Centrifugal 8" Fairbanks-Morse Style 5813NE, Serial No. 279867 direct connected to 125 HP Fairbanks-Morse 1760 RPM 2200 V Serial 307275, motor

Speed Reducers

- 2 Link-Belt Worm Speed Reducers Frame 5, Rating 5.3 HP, Ratio 17½ to 1.

Miscellaneous

- 1 Lot of Head and Tail Pulleys and Drives
- 1 Lot of Used Pipe Fittings 4" to 16"
- 1 Lot Pillow Block Boxes
- 2 Wilfley Tables
- 1 Ellis Ball Mill

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TRUCK CRANE

1-½ yd. Universal truck crane, No. 1162, mid. on 7½ ton Mack truck, with Christie crawlers, 28-foot boom.

AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

CONVEYORS

- 1-18" x 45' Link Belt stationary conveyor, troughing belt type, elect. or gas power.
- 1-24" x 25' Northern portable belt conveyor, elect. power.
- 1-18" x 46' Smith Eng. Works, troughing type belt conveyor, elect. power.
- 1-14" x 25' Farquar portable scoop conveyor, gas power.

CRUSHERS

- 1-30x30" Jeffrey, single roll coal crusher, No. 1376.
- 1-No. 4 Champion jaw crusher, size 9x15", Ser. No. 2606.
- 1-No. 2 Climax jaw crusher, size 9x16".
- 1-Buchanan jaw crusher, size 10x16".
- 1-Acme jaw crusher, Ser. No. 1873, size 12x20".
- 1-Acme jaw crusher, Ser. No. 1686, size 9x16".
- 1-United Iron Works, "Blake-type" jaw crusher, size 9½x24".
- 1-Allis Chalmers, No. 5 gyratory crusher, Ser. No. 5331, opening 10x38".
- 1-Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½".

DERRICKS

- 3-Steel guy derricks; 1-20-ton American-Terry 90' mast, 110' boom; 1-6-

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CRUSHERS

GYRATORY: 42" Gates K. 90" Superior McCully (Like new). 29" Superior McCully, Gates Nos. 12, 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Tel-smith Nos. 4, 5, 6, 8C, 9 & 10. Also many Austins, Kennedys and Traylor's, many sizes.

JAW TYPE: Traylor 60x24, 48x30, 42x18, 24x12. Superior 42x26 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1080. Acme 24x40. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 15x28.

REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Tel-smith 3-F & 40. Traylor 90" 22", 8", 10", 12". Super. McCully 6" & 10". Newhouse 5, 7 & 10". Symons Cone & Disc Tr. 3' to 4'.

ROLLS: Allis-C. 12½x12, 36x10, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x18. Etc. Etc.

HAMMERMILLS: Williams No. 1, 2, 3, 4, 8 & 9. Jeffrey 36x18 & 36x42. Day Nos. 20 & 40. Etc.

MILLS: Kennedy Ball 4x6, 5x8 & 5x8. Marcy 6x6 & 10x8. Hardinge 6'x3", 8'x30" & 6'x9". Misc. Tube Mills 5' & 6' x 23". Sturtevant Ring Roll, Raymond, Kents, Fuller-Lehigh, Etc., Etc.

CRUSHING PLANTS: No. 65 Diamond No. 22 Pioneer 9x34, 1080 Good Roads, 9x40 Austin-Western, 9x36 C.R.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Bolters, Cabiways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Draglines, Drag Scrapers, Dredges, Drills, Engines, Elevators, Excavators, Generators, Hoists, Kline, Locomotives, Loaders, Motors, Pipes, Pumps, Ball, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc. In many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

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7229 Rogers Avenue CHICAGO

E. C. A. realizes that delayed jobs mean delayed supplies to our fighters; so getting equipment on the job promptly is a must with us. Time is a munition of war.

ton Terry guy derrick, 70' mast, 60' boom; 1-5-ton Insley, 75' mast, 80' boom; stiff leg derricks; 1-2-ton Pittsburgh, 26' boom, 15' mast. Also a number of wood stiff leg derricks, 1 to 5-ton capacity.

HOISTS (Elec., Gas, Steam)
55—Electric ranging from 20 HP up to 125 HP, consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.

Gas hoists ranging from 8 to 120 HP, single, double and triple-drums; all standard makes. (38 in stock.)
Steam, ranging from 8 HP to 60 HP, single, double and triple-drums; all standard makes.

LOCOMOTIVES

4-7-ton Plymouth type 2, Model D, L. 24" gauge locomotives, power gasoline engines.

3-7-ton Whitcomb type MO 24" gauge, power gasoline engines.

1-7-ton Plymouth 24" gauge type 2 Model HL power gasoline engine.

1-3½-ton Plymouth 24" gauge Model A L 105, gasoline power.

1-3-ton Whitcomb 24" gauge, type U T gasoline power engine.

PNEUMATIC TOOLS

Jack Hammers, Spades, Paving Breakers and Wagon Drills.

PUMPS (Dredging)

1-10" Morris sand pump, Ser. No. 86864, cap. 87 cu. yds. per hr.

1-8" Cataract dredging pump, Ser. No. 175895, cap. 2000 GPM @ 53' head.

1-6" Morris dredging pump, Ser. No. 91802, cap. 1050 GPM @ 53' head.

1-6" Morris dredging pump, Ser. No. 180639.

EQUIPMENT CORPORATION of AMERICA.

FOR SALE

Batching Bin, four compartment of rated 170 tons, complete with one yard batcher dial scales.

NATIONAL SLAG COMPANY
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Scales-Vibrating Screens

Used guaranteed motor truck and warehouse scales, no priority needed. Vibrating Screens and Coal Crushers. Low prices. Immediate delivery.

BONDED SCALE COMPANY

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What do you need?

562 ft. C-P two-stage air compressor.
1¼ yd. Osgood Gas Crawler Crane or Shovel.
¾, 1 yd. and 1¼ yd. Shovel Attachments.
150 and 180 HP Fairbanks Morse Diesels.
1 yd., 1¼ yd. and 2 yd. Dragline Buckets.
60 ton 21 x 28" Switching Locomotive.

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Have us anything for sale!

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Steam Driven Air Compressors
Large Steam Pumps
Guaranteed Used Pipe
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Tanks of all kinds and sizes.

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Conveyor Belting...Transmission
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NEW, GUARANTEED & LOW PRICED**

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

Width Ply	Width Ply	Width Ply
18" - 6	10" - 6	6" - 5
16" - 6	10" - 5	5" - 5
14" - 6	8" - 6	4" - 5
12" - 6	8" - 5	4" - 4
12" - 5	6" - 6	3" - 4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes "D" WIDTH All Sizes
"B" WIDTH All Sizes "E" WIDTH All Sizes
"C" WIDTH All Sizes Sold in Matched Sets
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**PROTECT THAT PLANT
FIRE HOSE**

Size	Length	Per Length
2 1/2"	50 feet	\$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1 1/2"	50 "	20.00
	25 "	11.00

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- 1-1/2 ton Electric Hoist, Robbins & Meyer, with 1/2 cu. yd. Buckle.....\$225.00
- 1-Tumbling Barrel or Star Mill made by Whiting Foundry Equipment Co., 3 ft. dia., 5 ft. long, gear driven.....\$350.00
- 1-3 ft. x 5 ft. Deister Double Deck Screen, Serial 202, Model B, with 1/2 h.p. Motor.....\$375.00
- 1-Skinner Bros. Industrial Hot Air Heating Unit with Blower.....\$350.00
- 1-Anchord Tamp Machine, Five drop.....\$450.00
- 2-Anchord Tamp Machines, Four drop, each.....\$450.00
- 1-Anchord Backup Attachment.....\$ 75.00
- 1-Offield Gas Fired Boiler, 5 h.p., Style O, No. AH10499.....\$175.00
- 10-Silo Hoops, 9 ft. diameter, each.....\$ 5.00
- 3-14 cu. ft. Blasting Mixers, each.....\$275.00
- 1-16 cu. ft. Measuring Hopper with Track.....\$375.00
- 4-Multiplex Hand Machines.....each \$ 25.00

Gyratory Crushers: Nos. 5, 6, 7 1/2, 8, 10, 12 & 18N, Allis-Chalmers, Nos. 5, 10N, 25BBB & 37 Kennedy. Various sizes Teismith.
Jaw Crushers: Universal 10x20, 10x30 & 15x20", Farrell, 13x21, 14x30, 18x36 & 24x36", 22x30" Champion, Buchanan 12x36", single Roll Crushers, 18x24 & 21x42" McLanahan & S. 18x18" Jeffrey, 36x60" Fairmount Corrugated shell, Symons Cone, 2', 3' & 5 1/2'. Coarse bowl.
2, 3- & 4-Yard Koppel & Atlas Dump cars.
Buckeye Model 36 wheel type Ditcher.
4 & 8 ton, 24" gauge Gasoline Locomotives.
5 miles Portable Track, 15' Sections.
Bucyrus 50-R 2-yd. Steam Crawler Shovel.
Two Bucyrus Class 14 Draglines, One Steam, One Electric.
Diesel & Natural Gas Engines, with and without Generators.
Compressors, Elevators, Conveyors, Screens.
100 HP Fairbanks M Diesel Engine, bargain.

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3 Kritzer & Schultless Hydrators.
AIR COMPRESSORS
BELTED: 355, 525, 676, 1000, 1300 & 1370 Ft. ELECTRIC: 478, 676, 807, 1302, 1722 & 2200 Ft. DIESEL: 603, 807 & 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft. STEAM: 49, 310, 525, 1300, 2200 & 3600 Ft.
CLAMSHELL BUCKETS, SKIPS & GRAPPLERS
Gorman R A & H Stone Grapplers.
3 Yd. OWEN Type S Material Handling.
1 1/2 Yd. 1 Yd. & 3/4 Yd. HAYWARD Class E.
18 Steel Skips 6 1/2 x 6 x 2 1/2.
5 Ton Bucyrus Rock Grabs.

CRANES AND DRAGLINES

4 1/2 Yd. 5 Ton O & S 30 Ft. Boom.
12 Ton NORTHWEST 50 Ft. Boom Gas.
20 Ton LIMA, 750 Diesel, 65 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Loco.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

CATERPILLAR SHOVELS

3/4 Yd. Lima Diesel.
2 Yd. Marion Steam Shovel.
3/4 Yd. 1 1/2 Yd. 2 Yd. & 4 Yd. MARION Electric.
1 Yd. NORTHWEST Gas.
1 1/2 Yd. LIMA Diesel.
1 1/2 Yd. BUCYRUS 41B Steamer.
4 Yd. Bucyrus 120B Electric. Also 3 yd. Erie Elec.

DUMP CARS

46-KOPPEL 1 1/2 Yd. 24 & 30 in. Ga., V Shaped.
15-2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 in. Ga.
20-Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.
15-Std. Ga. 50 Ton Battleship Gondolas.

FLAT CARS

9-50 ton std. ga. heavy duty flat cars.

HOISTING ENGINES

Gas: 15, 30, 60, 100 & 120 HP.
Electric: 30, 52, 80, 100 & 150 HP.
Steam: 6 1/2 x 8, 7 x 8, 8 1/2 x 10, 10 x 15, 12 x 14.

DIESEL UNITS

75, 90, 180, 200 HP. F. M. Engines.
110 HP Ingersoll Rand Engine.
175 KVA Worthington 3/60/2300.
275 KVA Fairbanks 3/60/2300.

BALL, ROD AND TUBE MILLS

6x3 Pebble Mill & 5x5 Batch Mill.
5'x22" HARDINGE CON. Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
6'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x5, 6x6 & 10x9 Straight Ball Mills.
4x16, 5x18 & 5x22 Tube Mills & 6'x22".
3 1/2 x 8 & 5x7 Air Swept Tube Mills.
2x1 1/2, 6x12 & 5x12 BOD MILLS.

PULVERIZERS

JEFFERY, 24x30 & No. 1 Sturtevant Ring Roll.
RAYMOND Auto Pulverizer No. 0000, 0 & 3.
RAYMOND Imp. Mills, No. 4, 32 & 55.
GRUENDLER XXX Mill & Jay Hec No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 Chaser M.

STEEL STORAGE TANKS

10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

MATERIAL BIN

116 Ton Blaw Knox 3 Comp.

400 BARREL CEMENT BIN

400 Barrel Butler Portable Cement Bin with Fuller automatic batcher, push button control.

SEPARATORS AND COLLECTORS

8, 10 and 14 ft. Separators, Garco & Bradley.

ROLL CRUSHERS

36x60 Fairmount & 36x20 Diamond.

JAW CRUSHERS

10x8, 13x7 1/2, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12, 30x15, 30x18, 30x20, 30x18, 30x14, 30x9, 30x6, 30x10, 30x24, 42x9, 48x24, 48x36, 60x42, 60x60, 36x16, 0x36.

CONE & GYRATORY CRUSHERS

42 in. McCully Mammoth Gyratory.
50 in. 25, 27 & 49 Kennedy.
18 in. 24 in. 30 in. 36 in. & 48 in. Symons Disc.
4-10 TZ Traylor 4 ft. Gyratory.
4-Nos. 5, 3 & 6 Austin Gyratory.
2-Traylor T-12 Bulldog Gyratory, also 16 inch 8 in. Traylor T. Gyratory.
17 Gates K-Nos. 3, 4, 5, 6, 7 1/2, 8 & 9 1/2.
10 inch Austin Model 105.
6, 10 & 13 inch Superior McCully.

SYNCHRONOUS MOTOR GENERATORS

100 K.W. RIDGWAY 3/60/2200-250-275 volt.
150 K.W. GEN. ELEC. 3/60/2200-250-275v., 900 rpm.
200 K.W. RIDGWAY 3/60/2200-250-275v., 900 rpm.

SLIP RING MOTORS

52HP. GEN. ELEC. 3/60/440v., 1200 rpm.
(3) 100 HP. GEN. ELEC. 3/60/440v., 900-1200 rpm.

CONVEYOR PARTS

BELT: 1000 Ft. 60 in., 700 Ft. 40 in., 600 Ft. 36 in., 800 Ft. 30 in., 1642 Ft. 24 in., 517 Ft. 20 in., 297 Ft. 18 in., 500 Ft. 16 in., 300 Ft. 14 in.
IDLERS: 54 in., 42 in., 36 in., 30 in., 24 in., 20 in., 18 in., 16 in. & 14 in.
Head & Tail-Pulleys-Takenup for all sizes.
Steel Frames: 2,000 Ft. 24 in., 20 in. & 30 in. Sections.

ROTARY DRYERS AND KILNS

36 in. x 20 Ft. 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 20 Ft., 6 Ft. x 20 Ft., 6 Ft. x 20 Ft., 6 Ft. x 20 Ft., 7 1/2 x 100 & 110 Ft. Kilns.

STEEL DERRICKS

GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

LOCOMOTIVES

GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12 1/4 and 30 Ton.
STEAM: 20 Ton, 30 Ton, 40 Ton, 50 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton.
DIESEL: 4, 8 & 15 Ton.

SCREENS

VIBRATING: 2x4, 3x5, 12x8, 3x8, 3x5, 4x5, 4x8, 4x10, 4x12 & 12' x 1' 2' & 3' Deck.
HUMMER ROTEX, NIAGARA & ROBINS.
REVOLVING: 3x12, 3x16, 3 1/2 x 18, 3x24, 4x16, 4x20, 4x23, 4x24, 5x20, 5x20, 6x20.

TIDEWATER EQUIPMENT & MACHINERY CORP.
COMPLETE PLANTS BOUGHT AND SOLD
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New York, N. Y.

SHOVELS AND CRANES

- 1 1/2 yd. Ogcock Shovel with 55-ft. Crane Boom, 4-cylinder Leroy Engine.
- 1/2 yd. Buckeye Shovel, 4-cylinder Waukesha.
- 1/2 yd. Orton Crane, 4-cylinder Waukesha, 40-ft. Boom.
- 1/2 yd. Isaley, 4-cylinder Buda motor.
- 1/2 yd. General with 6-cylinder Waukesha.
- 1/2 yd. Byers 1/2 swing with 4-cylinder Hercules motor.

Universal Truck Crane mounted on Mack truck.

CRUSHERS, JAW AND GYRATORY

- 2-24 x 36 Farrell Jaw Crushers.
- 2-18 x 36 Farrell Jaw Crushers.
- 1-18 x 36 Acme Jaw Crusher.
- 2-15 x 30 Farrell Jaw Crushers.
- 2 1/2 Climax Jaw Crusher.
- 12 x 24 Champion Jaw Crusher.
- 10 x 20 Acme Jaw Crusher.
- 9 x 18 Reliance Jaw Crusher.
- 18A Telsmith Gyratory Crusher.
- 87 Kennedy Reduction Crusher with motor.
- No. 3 Austin Gyratory Crusher.

ROLL AND ROTARY CRUSHERS

- 40 x 16 Allis Chalmers, smooth rolls.
- 26 x 20 Kennedy, smooth rolls.
- 22 x 12 Allis Chalmers, smooth rolls.
- 10 x 16 New Holland double roll Crusher.
- 10 x 12 New Holland double roll Crusher.
- No. 1 Sturtevant open door Rotary Crusher.

SCREENS, VIBRATOR AND REVOLVING

- 6 x 10 Niagara double deck Mogul.
- 8 x 10 Niagara double deck Mogul.
- 5 x 10 Niagara single deck Mogul.
- 4 x 8 Telsmith double deck pulsator.
- 3 x 8 Telsmith double deck pulsator.
- 4 x 5 Link Belt single deck vibrator.
- 5' x 30' heavy duty Traylor positive drive revolving.
- 5' x 24' Traylor pinion drive revolving screen.
- 4' x 18 Telsmith revolving screen.
- 42" x 14' Acme revolving washing screen.
- 36" x 10' Acme revolving screen.

ELEVATORS AND CONVEYORS

- 80" continuous bucket Elevator belt 66' center.
- 24" continuous bucket Elevator double chain, steel frame 75' center.
- 18" continuous bucket Elevator belt, 72' center.
- 18" continuous bucket Elevator, 35' center.
- 16" continuous bucket Elevator manganese chain, 40' center.
- 13" continuous bucket Elevator chain, 28' center.
- 13" continuous bucket Elevator chain, 24' center.
- 12" centrifugal discharge, 46' center.
- 12" centrifugal discharge, 60' center, heavy duty chain.
- 12" centrifugal discharge, 35' center, steel enclosed.
- 8" centrifugal discharge, 30' center.

Also a lot of chain and sprockets for different Elevators.

- 100'-30" Belt Conveyor, no frame or belt.
- 200'-24" Belt Conveyor, no frame or belt.
- 120'-24" Belt Conveyor, no frame or belt.
- 170'-18" Belt Conveyor, no frame or belt.
- 80'-18" Belt Conveyor, channel iron frame and belt.
- 30'-16" Belt Conveyor, channel iron frame and belt.

Also a lot of 18"-24" and 30" Belt Conveyor idlers, ball and roller bearing.

PUMPS, CENTRIFUGAL AND PRESSURE

- 6" Allis Chalmers centrifugal pump, 170' head, 1500 G.P.M., 75 hp. motor.
- 3" Lawrence centrifugal pump, 180' head, 250 G.P.M., 15 hp. motor.
- 2 1/2" Penna. centrifugal pump, 120' head, 200 G.P.M., 10 hp. motor.
- 3 x 5 Myers Piston high pressure pump, 500' head, 600 lb. pressure, 3 hp. motor.
- 3 x 3 Myers piston well pump, 1 hp. motor.
- 3 piston pressure pumps, belt drive.

HOISTS, SINGLE AND DOUBLE DRUM

- Mead-Morrison 2-yd. drag line hoist No. 18552.
- Mead-Morrison 1-yd. drag line hoist No. 9155 with 10 hp. motor.
- Mead-Morrison 1-yd. drag line hoist No. 13566.
- Sauerman drag line hoist.
- 80" diameter single drum mine hoist.
- 18" diameter single drum friction hoist.

MISCELLANEOUS

- 1-60 Caterpillar Tractor with Bulldozer.
- 1-Gallion Grader on caterpillars.
- 6-Heavy duty bin gates, cast iron.
- 1-Acetylene cutting outfit, complete.
- 130'-8" pipe, 70'-6" pipe, 120'-3" pipe.
- 1-Tank, 12" diameter, 22' long.

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1913 DEPENDABLE MACHINERY FOR 30 YEARS 1943

- 1 SHOVEL, Koehring Model No. 2, 1 1/2 yd., powered by 4-cylinder gasoline engine, 100 hp. motor. \$8250.00
- 1 CRANE, P & H, Model 206, 40' boom, powered by 4-cylinder gasoline engine. 2500.00
- 1 CONCRETE PAVING, Koehring Model 2716, complete with boom, bucket, water tanks, etc. 1995.00
- 1 PAVING MACHINE, Adnan Blacktop, good condition. 3327.50
- 2 WAGON DRILLS, Cleveland Model DR8. EACH 1020.00
- 1 CRAWLER WAGON, LePlante-Chaste, 10-90, side dump. 1480.00
- 1 CRUSHING PLANT, Primary Crusher, Austin Western 21x38 Roller Bearing, with self feeder, powered by D13000 "Caterpillar" Diesel Engine, Secondary Crusher, 1040 Good Roads, Roller Bearing Crusher, powered by D8800 "Caterpillar" Diesel Engine, Reduction Crusher, Traylor 2'-4" Crusher, powered by D13000 "Caterpillar" Diesel Engine. 1-70' centers, Belt Conveyor, 24" wide, belt driven from 1040 Crusher. 1-70' centers, Belt Conveyor, 24" wide, powered by electric geared in head motor. 1-4x16, 2-deck Secco Screen, powered by electric motor. 1-3x12, 2-deck Holland Screen, belt driven from 1040 Crusher. 1-15 or 18 ton truck scale. 1-Sullivan 210 cu. ft. stationary compressor (less power). 1-Lot of drive belts, chains, sprockets, pulleys, etc. The above is a complete crushing unit and now in operation. Could be moved and reset without additional parts, etc. of any kind. 2 CRUSHERS, Good Roads 10x40 Roller Jaw Type, Rock Crushers. EACH 1500.00
- 1 CRUSHER, Rogers 10x24 Plain Bearing Jaw Type. 1450.00
- 1 CRUSHER, Good Roads 10x40 Roller Jaw Crusher, adjustable to 15x40, with 30' bucket elevator. 4365.00
- 1 SCREEN, Revolving, 12' x 42", center drive type. 450.00
- 6 Light Plants, Master Model MGE, 6.8 KVA. EACH 895.00
- 25 ROCK DRILLS, Cleveland and Ingersoll, rebuilt. EACH 125.00
- 1 AIR COMPRESSOR, Gardner-Denver, Portable, 210' capacity, powered by "Caterpillar" Diesel Engine. 3952.00
- 1 ELEVATOR, Columbus Bucket Elevator, 30' long with 14" buckets. 615.00

ROY-C-WHAYNE

SUPPLY COMPANY
800 WEST MAIN STREET
LOUISVILLE, KENTUCKY

- 1 No. 5 Kennedy Gearless Crusher
- 1 No. 19-S Kennedy Gearless Crusher
- 1 Conveyor 60' centers

STANDARD ROCK CO.
Morrison, Fla.

SPECIAL-CRANE

NORTHWEST MODEL 104, WITH 45' CRANE BOOM AND ONE YARD OWENS DIGGING BUCKET, also SHOVEL FRONT, all in good shape. Can be seen working. Complete-\$6750. Crane only-\$5200.

Metalweld, Inc.

2617 HUNTING PARK AVENUE,
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HUNLOCK CREEK, Sand and Gravel Company, also crushed stone quarry. One mile north of Shickshinny, Penna., on State Highway. Write Box B7, c/o Rock Products, 309 W. Jackson, Chicago, Ill.

MISCELLANEOUS

- 8-ton Whitcomb, 36" gauge, gasoline locomotive.
- 4-ton Vulcan, 36" gauge, gasoline locomotive.
- 36" gauge, Mercury, storage battery locomotive.
- 24" gauge and 36" gauge flat cars.
- 3 electric car rollers.
- Generators for Hummer screens.
- Centrifugal water pumps, motor, bins and tanks.
- Revolving dryer, 4' x 21' with 18" flue.

CRUSHERS, MILLS, ROLLS

- 10 1/2" x 21" New England jaw crusher.
- 11" Taylor "Bulldog" jaw gyratory crusher.
- Williams No. 2 "Regular" type hammermill.
- Williams No. 2 "Semi Vulcanite" type hammermill.
- Sturtevant No. 0 Rotary Fine crusher.
- Allis-Chalmers 42" x 16" type "J" crushing rolls.
- Heavy Duty 24" x 36" roll crusher.
- Simplex Unit Coal Pulverizer, type 33A.
- Single roll 24" x 24" crusher with knobs.
- 36" x 30" American Standard double roll crusher.
- 18" and 24" x 30" American Standard Disintegrator.

SCREENS, SAND TANKS

- 4 revolving screens, 2' x 8', 30" x 12', 3' x 8', 4' x 16'.
- Several Hummer vibrating screens, single and 2-deck.
- 2 Jigger double deck 2' x 5' vibrating screens.

BUCKET ELEVATORS

- 50' elevator with 18" steel buckets on chain.
- 40' elevator, 12" malleable buckets on chain.
- 50' elevator with 20" malleable buckets, 2-strand chain.
- 40' enclosed elevator, 8" malleable buckets on chain.
- 25' elevator with 6" malleable buckets on chain.
- 6-25' bucket elevator, 4" and 5" buckets on belt.
- 35' continuous elevator, 30" buckets, 2-strand chain.
- 3000' 6-ply 20" elevator belt with 18" grain buckets.

- Gears, sprockets, elevator and driving chain.
- Malleable, Salem, Continuous buckets, 4" to 30".
- BELT CONVEYORS
- 36" trough belt conveyor up to 300' with belt.
- 30" trough belt conveyor up to 150' with belt.
- 42" trough belt conveyor up to 360' with belt.
- 54"-12" 30"-30" conveyor belt.
- 70 cast head and tail pulleys with shafts and bearings for 36" conveyor belt.
- Head and tail pulleys for belt conveyors.
- Cast iron and steel driving pulleys.

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- 14 x 12" Chicago Pneumatic, 100 hp. slip ring motor.
- 4-cyl. Schramm, 360", with 60 hp. motor, V belts.
- Ing-Rand portable 275' with 50 hp. Waukesha engine.
- Curtis 3-stage, 200 lb., 11.5" with 5 hp. motor.

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Centrif. Elec. Jaeger, 5 x 5
Centrif. Gas, Homelite 2"
Centrif. Gas, Jaeger Speed Boy 2"
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Diaphragm, Gas, Jaeger—4"
Diaphragm, Gas, Jaeger—2"
Force, Steam, Gardner-Decker 2"
Force, Gas, Myers 2"
Force, Domestic 2"
Force, Domestic 2"
Force, Myers 2"
Force, Jaeger 2"
Force, Gas, J. L. Case, Hand Pump

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Clay Digger, Air Trench, Chicago-Pneumatic

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300 ft. of 24" Conveyor Belt

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Gyrotory Crusher: K.V.S. 30, 37-8, 49; Telsmith 32, 3A, 8B; Traylor 8"; McCully 13", 8" 6". Jaw: 6x12, 9x16, 10x20, 14x24, 12x26, 13x30, 15x30, 16x32, 56x84. Complete Rock Crushing Sand & Gravel Plants.

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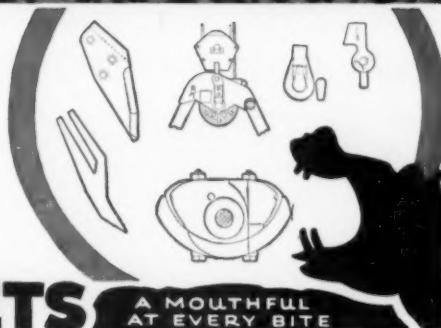
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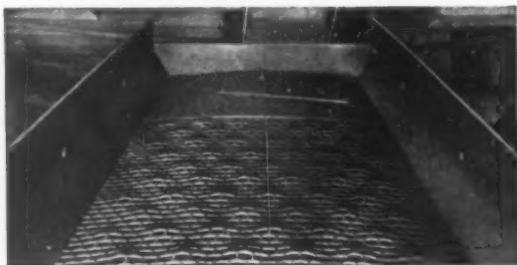
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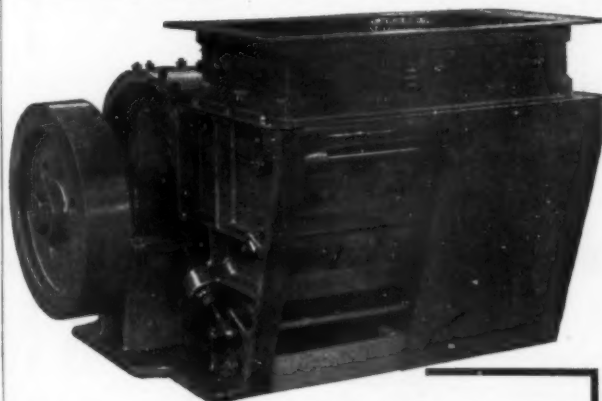
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Dig to win!

Dig to win!

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- ★ 2 Spot in line with arc of swing.
- ★ 3 Spot so load swings over from rear of truck. Don't swing over cab.
- ★ 4 Swing out from bank as soon as dipper or bucket is fully loaded.
- ★ 5 Keep swing short . . . spot hauling equipment in close.
- ★ 6 Try to get a full dipper or bucket every pass, as well as to fill every truck or car, but do not overload.
- ★ 7 Keep close to your digging — don't "stretch" to reach it.
- ★ 8 Watch your lubrication to avoid maintenance. Watch your maintenance to avoid lost time.
- ★ 9 Keep that steady pace which means no slowdown at end of shift.

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